

5-YEAR REVIEW

Short Form Summary

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

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 for 129 Species in Oregon, Washington, Idaho, Hawaii, Montana, California, and Nevada. Federal Register 85(48): 14240–14243, March 11, 2020.

Lead Region/Field Office:

Interior Region 12/Pacific Islands Fish and Wildlife Office (PIFWO), Honolulu, Hawai‘i

Name of Reviewer:

Cheryl Phillipson, Biologist, PIFWO

Lauren Weisenberger, Plant Recovery Coordinator, PIFWO

Megan Laut, Conservation & Restoration 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 or USFWS) beginning in October 2021. The review was based on a review of current, available information since the last 5-year review for *Phyllostegia knudsenii* (USFWS 2017). The evaluation by Cheryl Phillipson, Biologist, was reviewed by Lauren Weisenberger, Plant Recovery Coordinator, and Megan Laut, Conservation and Restoration 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 (<https://ecos.fws.gov/ecp/species/5098>).

Review Analysis:

Please refer to the previous 5-year reviews for *Phyllostegia knudsenii* published in the Federal Register on June 2, 2009, and September 17, 2017 (available at http://ecos.fws.gov/docs/tess/species_nonpublish/1379.pdf and http://ecos.fws.gov/docs/tess/species_nonpublish/2483.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. knudsenii*.

This short-lived perennial herb in the Lamiaceae (mint) family is listed as endangered and is known from the island of Kaua‘i. The status and trends for *Phyllostegia knudsenii* are provided in the tables below.

New Status Information:

Currently, there are no known individuals of *Phyllostegia knudsenii* on Kaua‘i. This species was last observed in 2001, and sites where it previously occurred were surveyed in 2008, but no plants were found (USFWS 2009). Wood et al. (2019, p. 11) assessed *P. knudsenii* as possibly extinct in the wild, with no propagative materials in storage.

New Threats:

- None reported.

New Management Actions:

- None reported.

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

Date	No. wild individuals	No. outplanted	Stability Criteria identified in Recovery Plan	Stability Criteria Completed?
1996 (listing)	1	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
1998 (recovery plan)	3	0	All threats managed in all 3 population	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2003 (critical habitat)	4–13	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2009 (5-year review)	0	0	All threats managed in all 3 populations	No
			Complete genetic storage	No

			3 populations with 50 mature individuals each	No
Date	No. wild individuals	No. outplanted	*Preventing Extinction Criteria identified by HPPRCC	*Preventing Extinction Criteria Completed?
2017 (5-year review)	0	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			Reproduction (i.e., viable seeds, seedlings) at all 3 populations	No
			3 populations with 50 mature individuals each	No
2022 (5-year review)	0	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			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 knudsenii* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Destruction and degradation of habitat by feral ungulates	A	Ongoing	None
Established ecosystem altering invasive plant species degradation of habitat	A	Ongoing	None
Climate change degradation and destruction of habitat, including hurricanes	A	Ongoing	None
Reduced viability due to low numbers	E	Ongoing	None

Synthesis:

Currently, there are no known individuals of *Phyllostegia knudsenii* on Kaua‘i. No plants were located on surveys in areas of historical occurrences and there are no collections or propagative materials in storage. There remains suitable habitat to survey.

Stabilizing (interim), downlisting, and delisting objectives are provided in the Kaua‘i Islandwide Recovery Plan (USFWS 2021) 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 knudsenii is a short-lived perennial herb. 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 Kaua‘i where this species now occurs or occurred historically and each of these populations must be naturally reproducing (i.e., viable seeds, seedlings) with a minimum of 50 mature, reproducing individuals per population.

The preventing extinction goals for *Phyllostegia knudsenii* have not been met. There are no known individuals (Table 1). There are no collections or propagative materials in storage (Table 1, Table 2). This species is susceptible to the threats of habitat destruction by feral ungulates, nonnative plant competition, and hurricanes (Table 2). Therefore, *P. knudsenii* meets the definition of Endangered as it remains in danger of extinction throughout its range.

Recommendations for Future Actions:

No new threats and no significant new information regarding the species’ biological status have been reported since the last 5-year review in 2017. Thus, the following recommendations for future actions are reiterated or updated for the 5-year review for 2022.

- Surveys and inventories—Continue to survey for populations of *Phyllostegia knudsenii* in areas of potentially suitable habitat.
- Feral ungulate monitoring and control—If individuals are found, construct exclosures to protect occurrences against disturbance by feral ungulates.

- Nonnative invasive plant monitoring and control—If individuals are found, control established ecosystem-altering nonnative invasive plant species at all populations.
- Climate change adaptation strategy—Research suitability of habitat for viability of species, if found, including where to conduct translocations in the future due to impacts of climate change.
- Captive propagation for genetic storage and reintroduction—If individuals are found, begin collection and propagation efforts for maintenance of genetic stock.
- Reintroduction and augmentation—If individuals are found, begin reintroduction of individuals into protected suitable habitat that is being managed for known threats to this species.
- Build resiliency and redundancy—Increase numbers of individuals and populations through historic range to reduce impacts of ungulates, nonnative invasive plants, low numbers, and hurricanes.
- Population biology research—If individuals are found, study the populations to determine viable population size and structure, geographical distribution, flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, limiting factors, and threats.
- 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.
- [USFWS] U.S. Fish and Wildlife Service. 2009. *Phyllostegia knudsenii* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. https://ecos.fws.gov/docs/tess/species_nonpublish/1379.pdf.
- [USFWS] 2017. *Phyllostegia knudsenii* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. https://ecos.fws.gov/docs/tess/species_nonpublish/2483.pdf.
- [USFWS] 2020. Endangered and threatened wildlife and plants; initiation of 5-year status reviews for 129 Species in Oregon, Washington, Idaho, Hawaii, Montana, California, and Nevada. Federal Register 85(48): 14240–14243, March 11, 2020.
- [USFWS] 2021. Kaua‘i Islandwide Recovery Plan. U.S. Fish and Wildlife Service, Portland, OR. 65 pp. + appendices.
- Wood, K., H. Oppenheimer, and M. Keir. 2019. A checklist of endemic Hawaiian vascular plant taxa that are considered possibly extinct in the wild, May 2019. 17 pp.

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SIGNATURE PAGE for 5-YEAR REVIEW of *Phyllostegia knudsenii*
(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
- X No Change in listing status

For Field Supervisor, Pacific Islands Fish and Wildlife Office

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