# 5-YEAR REVIEW

Short Form Summary

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

**Current Classification**: Endangered

**Federal Register Notice announcing initiation of this review:**

[USFWS] U.S. Fish and Wildlife Service. 2022. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status reviews for 167 Species in Oregon, Washington, Idaho, Montana, California, Hawaii, Guam, and the Northern Mariana Islands . Federal Register 87(90): 28031–28034, May 10, 2022.

**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, PIFWO
Megan Laut, Recovery Program 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 2023. The review was based on a review of current, available information since the last 5-year review for *Phyllostegia kaalaensis* (USFWS 2019). The evaluation by Daniel Adamski, Biologist, was reviewed by Lauren Weisenberger, Plant Recovery Coordinator, and Megan Laut, Recovery Program 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/6690*).

**Review Analysis:**

Please refer to the previous 5-year reviews for *Phyllostegia kaalaensis* published in the Federal Register on January 18, 2008, (available at *https://ecos.fws.gov/docs/tess/species_nonpublish/1189.pdf*); August 12, 2013, (available at *https://ecos.fws.gov/docs/tess/species_nonpublish/2091.pdf*), and on September 30, 2019, (available at *https://ecos.fws.gov/docs/tess/species_nonpublish/2888.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. kaalaensis*.

This short-lived perennial erect to decumbent herb in the Lamiaceae (mint) family is endangered and is known from the island of O‘ahu. The status and trends for *Phyllostegia kaalaensis* are provided in the tables below.

New Status Information:

- Currently, there are no known wild populations of *Phyllostegia kaalaensis* (Army Natural Resources Program on O‘ahu [ANRPO] 2023a).
- Currently, there are approximately eight founder lines represented in *ex situ* storage and propagation collections, including seeds in seed banks and explants in tissue culture (ANRPO 2023b, Appendix 4-3).

New Threats:

- None

New Management Actions:

- Ungulate monitoring and management—Ungulates are controlled and fencing is maintained by ANRPO at four management units encompassing historic wild and reintroduced population sites (ANRPO 2023b, Appendix 4-2).
- Invasive nonnative plant management— The ANRPO controls non-native plants in three management units encompassing historic wild and reintroduced populations (ANRPO 2023b, Appendix 4-2
- Collection and propagation for genetic storage and reintroduction—
    - ANRPO reports three total founder plants in seed storage, with two founders having at least 10 viable seeds, and one individual plant in cultivation (ANRPO 2023b, Appendix 4-3).
    - Lyon Arboretum Micropropagation Laboratory reports 433 explants in micropropagation representing eight founders, and the Lyon Seed Conservation Laboratory reports 12 seeds in storage from one founder (Lyon Arboretum 2022, 2023).
- Reintroduction/ Augmentation/ Introduction—
    - There are no surviving reintroduced individuals of *Phyllostegia kaalaensis* (Army Natural Resources Program on O‘ahu [ANRPO] 2023a).

**Table 1. Status and trends of *Phyllostegia kaalaensis* from listing through current 5-year review. Table 1a shows progress according to Interim Stabilization Goals; Table 1b shows progress according to Preventing Extinction Goals.**

**Table 1a.**

| Date | No. wild individuals | No. Outplanted | Stability Goals identified in Recovery Plan | Stability Goals Completed? |
|---|---|---|---|---|
| **1996 (Listing)** | <50 | 0 | All threats managed in all 3 populations | No |
| | | | Complete genetic storage | No |
| | | | 3 populations with 50 mature individuals each | No |
| **2008 (5-year review)** | 0 | 2 | All threats managed in all 3 populations | Partially |
| | | | Complete genetic storage | Yes |
| | | | 3 populations with 50 mature individuals each | No |
| **2013 (5-year review)** | 0 | 0 | All threats managed in all 3 populations | Partially |
| | | | Complete genetic storage | Yes |
| | | | 3 populations with 50 mature individuals each | No |

**Table 1b.**

| Date | No. wild individuals | No. outplanted | *Preventing Extinction Criteria identified by HPPRCC | *Preventing Extinction Criteria Completed? |
|---|---|---|---|---|
| **2019 (5-year review)** | 0 | >200, none survive | All threats managed in all 3 populations | Partially |
| | | | Reproduction (i.e., viable seeds, seedlings, saplings) at all 3 populations | No |

| | | | | |
|---|---|---|---|---|
| | | | Complete genetic storage | Yes |
| | | | 3 populations with 50 mature individuals each | No |
| **2024 (5-year review)** | 0 | 0 | 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 kaalaensis* and ongoing conservation efforts**.

| Threat | Listing factor | Current Status | Conservation/ Management Efforts |
|---|---|---|---|
| Degradation and destruction of habitat by feral ungulates | A | Ongoing | Partial, ungulate control at four management units |
| Established ecosystem altering invasive plant species degradation of habitat | A | Ongoing | Partial, nonnative plant control at three management units |
| Climate change degradation or loss of habitat, including hurricanes | A | Ongoing | None |
| Ungulate predations and herbivory | C | Ongoing | Yes, ungulate control at four management units |
| Disease | C | Ongoing | Partial, long-term control measures for powdery mildew unknown |
| Competition with established invasive plant species | E | Ongoing | Partial, nonnative plant management in three management units |
| Reduced viability due to low numbers | E | Ongoing | Partial, seed storage and micropropagation ongoing |

**Synthesis:**
Currently there are no known wild individuals of *Phyllostegia kaalaensis* on O‘ahu. Management units encompassing historic populations are protected by fencing, nonnative plant control, and ungulate control. Seed storage and micropropagation are ongoing.

Stabilizing (interim), downlisting, and delisting objectives are provided in the Recovery Plan for the O‘ahu Plants (USFWS 1998) 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 kaalaensis* is a short-lived perennial erect to decumbent 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 O‘ahu where they now occur 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 this species have not been met. Although genetic storage is complete (Table 1), there are no known wild or reintroduced individuals, and all threats are not being managed (Table 1, Table 2). Therefore, *Phyllostegia kaalaensis* 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 2019. Thus, the following recommendations for future actions are updated or reiterated for the 5-year review for 2024.

- Surveys and monitoring—
  - Continue monitoring and surveying for populations of *Phyllostegia kaalaensis*.
  - Determine suitable locations for reintroductions.
- 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 *P. kaalaensis*.
- Site and habitat protection—Develop and implement effective threat control measures to reduce the impact of small population size.
- Fire prevention and control—Continue to develop and implement fire prevention management plans.
- 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 increasing frequency and intensity of hurricanes. Additional management actions may be needed, such as locating key microsites that overlap with current and future climate envelopes for translocation efforts.
- Disease control—Continue to research and implement effective control methods for powdery mildew.
- Predator and herbivore monitoring and control—Determine and continue to implement effective methods to control rats and slugs.
- Captive propagation for genetic storage and reintroduction—Continue collection and 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 into suitable habitat that is being managed for known threats to this species to reduce impacts of climate change degradation and nonnative plant competition.
- 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:**

[ANRPO] Army Natural Resource Program on Oʻahu. 2023a. 2023 status report for the Makua and Oahu implementation plans. 255 pp.

[ANRPO] 2023b. Appendices to the Status report for the Mākua and Oʻahu Implementation Plans, Army Natural Resources Program, Oʻahu, Office of the Vice President for Research and Innovation, University of Hawaiʻi.

[HBMP] Hawaii Biodiversity and Mapping Program. 2010. Plant species GIS data and Access database.

[HPPRCC] Hawaiʻi 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, Hawaiʻi.

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[U.S. Fish and Wildlife Service] U.S. Fish and Wildlife Service. 1998. Recovery plan for the Oahu plants. U.S. Fish and Wildlife Service, Portland, Oregon. 207 pages, plus appendices.

[USFWS] 1999. Recovery Plan for the Multi-Island Plants. 2006 pp. + appendices.

[USFWS] 2008. *Phyllostegia kaalaensis* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. *https://ecos.fws.gov/docs/five_year_review/doc1189.pdf*.

[USFWS] 2012. Endangered and threatened wildlife and plants; Endangered status for 23 species on Oahu and designation of critical habitat for 124 species; final rule. Department of the Interior, Federal Register 77 (181): 57648–57862, September 18, 2012.

[USFWS] 2013. *Phyllostegia kaalaensis* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. *https://ecos.fws.gov/docs/five_year_review/doc2091.pdf*.

[USFWS] 2019. *Phyllostegia kaalaensis*. 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. *https://ecos.fws.gov/docs/five_year_review/doc2888.pdf.*

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**U.S. FISH AND WILDLIFE SERVICE**
SIGNATURE PAGE for 5-YEAR REVIEW of *Phyllostegia kaalaensis* (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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