5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Pteralyxia macrocarpa* (kaulu)

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 *Pteralyxia macrocarpa* (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/2400*).

Review Analysis:

Please refer to the previous 5-year review for *Pteralyxia macrocarpa* published in the Federal Register on August 30, 2019, (available at *https://ecos.fws.gov/docs/tess/species_nonpublish/2799.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. macrocarpa*.

This long-lived perennial tree in the Apocynaceae family (dogbane) is endangered and endemic to O‘ahu. The current status and trends for *Pteralyxia macrocarpa* are provided in the tables below.

New Status Information:

- Currently, *Pteralyxia macrocarpa* is found scattered in over 20 populations in both the Waiʻanae and Koʻolau mountains of Oʻahu, totaling approximately 110 to 133 individuals (Togikawa et. al. 2022a; Togikawa et. al. 2022b; Lee 2023; Plant Extinction Prevention Program [PEPP] 2023; Togikawa et. al. 2023).
- Currently, approximately three founder lines are represented in *ex situ* storage, including explants in micropropagation, and plants in a nursery or living collection (Lyon Arboretum 2023; Oʻahu Nursery 2023).

New Threats:

- None

New Management Actions:

- Monitoring and surveys— PEPP monitors individuals of *Pteralyxia macrocarpa* in the Waiʻanae and Koʻolau mountains of Oʻahu (Togikawa et. al. 2022a; Togikawa et. al. 2022b; Plant Extinction Prevention Program [PEPP] 2023; Togikawa et. al. 2023).
- Ungulate monitoring and management — Fences and ungulates are monitored by the Army Natural Resources Program on Oʻahu [ANRPO], protecting some individuals of *Pteralyxia macrocarpa* in the Waiʻanae and Koʻolau mountains of Oʻahu (ANRPO 2023, Appendix 4-2).
- Nonnative plant control—Nonnative plants are controlled around *Pteralyxia macrocarpa* by PEPP (PEPP 2023; Togikawa et. al. 2023).
- Collection and propagation for genetic storage and reintroduction—
    - PEPP collected approximately fruit from one individual at Mākaha to be used for *ex situ* storage (Togikawa et. al. 2023).
    - Lyon Arboretum Micropropagation Laboratory reports one explant in micropropagation (Lyon Arboretum 2023).
    - The Oʻahu Nursery reports four individual plants in propagation representing two founders (Oʻahu Nursery 2023).

Table 1. Status and trends of *Pteralyxia macrocarpa* 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?
2012 (Listing)	291–347	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			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)	<120	0	All threats managed in all 3 populations	No
			Reproduction (i.e., viable seeds, seedlings, saplings) at all 3 populations	No
			Complete genetic storage	Partial
			3 populations with 50 mature individuals each	No
2024 (5-year review)	110–133	0	All threats managed in all 3 populations	Partial
			Complete genetic storage	Partial
			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 *Pteralyxia macrocarpa* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Degradation and destruction of habitat by feral ungulates	A	Ongoing	Partial, fencing, and ungulate exclosures
Established ecosystem altering invasive plant species degradation of habitat	A	Ongoing	Partial, invasive plant control around some individuals
Climate change degradation or loss of habitat, including hurricanes	A	Ongoing	None
Fire destruction and degradation of habitat	A	Ongoing	Partial, fire management plan in place
Landslides destruction and degradation of habitat	A	Ongoing	None
Rodent predation and herbivory	C	Ongoing	Partial, control at one population
Invertebrate predation and herbivory	C	Ongoing	Partial, control at one population

Synthesis:
Currently there are approximately 110 to 133 wild individuals of *Pteralyxia macrocarpa* on O‘ahu. Individuals are provided protection by fencing, invasive plant control, and ungulate control. Seed collections and propagation 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.

Pteralyxia macrocarpa is a long-lived, dioecious, perennial tree. 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. Genetic storage is not complete (Table 1), all threats are not being managed (Table 1, Table 2), and there is no population totaling at least 50 reproducing individuals. Therefore, *Pteralyxia macrocarpa* 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—
  - Monitor known populations of *Pteralyxia macrocarpa* and survey areas of potentially suitable habitat.
  - Determine suitable locations for reintroductions.
- Ungulate monitoring and control—Construct fenced exclosures to protect individuals from the negative impacts of browsing by ungulates.
- Invasive nonnative plant monitoring and control—Control established ecosystem-altering nonnative invasive plant species, and those that compete with *Pteralyxia macrocarpa*.
- Site and habitat protection—Develop and implement effective threat control and habitat protection measures to reduce the impact of landslides.
- Fire prevention and control—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.
- 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. 2023. 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.

Lee, J. 2023. Hawaiʻi Rare Plant Restoration Group (HRPRG) Field Data Form *in* PEPP 2023: Plant Extinction Prevention Program, FY 2023 Annual Report (Oct 1, 2022-Sep 30, 2023), USFWS CFDA Program #15.657, Endangered Species Conservation-Recovery Implementation Funds, Coop Agreement F22AC02205 (Interim Report), April 24, 2023, UH Mānoa, PCSU, PEPP. 20 pp.

Lyon Arboretum. 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, Hawaiʻi.

Oʻahu Nursery. 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, Hawaiʻi.

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Togikawa, K., M. Thomas, J. Tanino, and A. Tsuneyoshi. 2023. Hawai‘i Rare Plant Restoration Group (HRPRG) Field Data Form *in* PEPP 2023: Plant Extinction Prevention Program, FY 2023 Annual Report (Oct 1, 2022-Sep 30, 2023), USFWS CFDA Program #15.657, Endangered Species Conservation-Recovery Implementation Funds, Coop Agreement F22AC02205 (Interim Report), January 8, 2023, UH Mānoa, PCSU, PEPP. 20 pp.

[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] 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] 2019. *Pteralyxia macrocarpa*. 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. *https://ecos.fws.gov/docs/five_year_review/doc2799.pdf.*

[USFWS] 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.

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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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