

5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Pteralyxia kauaiensis* (kaulu)

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:

Daniel Adamski, 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) beginning in October 2021. The review was based on a review of current, available information since the last 5-year review for *Pteralyxia kauaiensis* (USFWS 2017). The evaluation by Daniel Adamski, 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/2943>).

Review Analysis:

Please refer to the previous 5-year reviews for *Pteralyxia kauaiensis* published in the Federal Register on August 27, 2010 (available at https://ecos.fws.gov/docs/tess/species_nonpublish/1617.pdf) and September 18, 2017 (available at https://ecos.fws.gov/docs/tess/species_nonpublish/2500.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. kauaiensis*.

This long-lived perennial tree in the Apocynaceae family (dogbane) family is endangered and is known from the island of Kaua‘i. The status and trends for *Pteralyxia kauaiensis* are provided in the tables below.

New Status Information:

- At the time of the last 5-year review in 2017 there were 10 populations totaling between 300 and 400 individuals on Kaua‘i (USFWS 2017). The current status of populations at Mahanaloa, Mākaha, Kalalau, and Hipalau Valley total approximately 230 individuals; the largest population, Mahanaloa, is estimated to contain 150 individuals, some of which occur in a fenced enclosure (National Tropical Botanical Garden [NTBG] 2018; 2020a-c). The current status of the remaining populations is unknown. The current population estimate is between 230 and 400 individuals.

New Threats:

- None.

New Management Actions:

- Monitoring and surveys— NTBG monitors populations of *Pteralyxia kauaiensis* on Kaua‘i (NTBG 2018; 2020a-c).
- Collection and propagation for genetic storage and reintroduction—
 - Limahuli Garden reports 2 seeds collected from an individual plant in 2020 (Nagendra et. al. 2021).
 - NTBG reports 5 seeds in storage from 1 founder (NTBG 2021). In addition, NTBG reports approximately 10 plants in a living collection at Limahuli Garden Lower Preserve (NTBG 2021).

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

Date	No. wild individuals	No. outplanted	Stability Criteria identified in Recovery Plan	Stability Criteria Completed?
1994 (listing)	170-300	0	All threats managed in all 5-7 populations	No
			Complete genetic storage	No
			5-7 populations with 100 mature individuals each	No
1995 (recovery plan)	500-1,000	0	All threats managed in all 5-7 populations	No
			Complete genetic storage	Partially

			5-7 populations with 100 mature individuals each	No
2003 (critical habitat)	1,124-1,161	0	All threats managed in all 5-7 populations	No
			Complete genetic storage	Partially
			5-7 populations with 100 mature individuals each	Yes
2010 (5-year review)	330-700	8-none survived	All threats managed in all 5-7 populations	No
			Complete genetic storage	Partially
			5-7 populations with 100 mature individuals each	Partially
Date	No. wild individuals	No. outplanted	*Preventing Extinction Criteria identified by HPPRCC	*Preventing Extinction Criteria Completed?
2017 (5-year review)	300-400	0	All threats managed in all 3 populations	No
			Reproduction (i.e., viable seeds, seedlings, saplings) at all three populations	Unknown
			Complete genetic storage	Partially
			3 populations with 25 mature individuals each	Yes
2022 (5-year review)	230-400	0	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially

			Natural reproduction at all 3 populations	Unknown
			3 populations with 25 mature individuals each	Partially

* 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 kauaiensis* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Degradation and destruction of habitat by feral ungulates	A	Ongoing	Some individuals provided protection by fencing
Established ecosystem altering invasive plant species degradation of habitat	A	Ongoing	None
Climate change degradation or loss of habitat, including hurricanes	A	Ongoing	None
Degradation and destruction by landslides	A	Ongoing	None
Collecting impacts	B	Ongoing	None
Predation and herbivory by ungulates	C	Ongoing	Some individuals provided protection by fencing
Predation and herbivory by invertebrates	C	Ongoing	None
Predation and herbivory by Rodents	C	Ongoing	None
Human disturbance—Fire mortality and reduced viability	E	Ongoing	None

Synthesis:

Currently, there are between 230 and 400 wild individuals of *Pteralyxia kauaiensis* on Kaua‘i. Some individuals are provided protection from ungulates by fencing.

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.

Pteralyxia kauaiensis is a long-lived 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 Kaua'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 25 mature, reproducing individuals per population.

The preventing extinction goals for this species have not been met. Genetic storage is not complete (Table 1), it is unknown if three populations contain reproducing individuals, and all threats are not being managed (Table 1, Table 2). Therefore, *Pteralyxia kauaiensis* 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 2017. Thus, the following recommendations for future actions are reiterated and updated for the 5-year review for 2022.

- Surveys and inventories—
 - Survey for populations of *Pteralyxia kauaiensis* in areas of potentially suitable habitat.
 - Determine if historical population is extirpated.
 - Determine sites that have the highest likelihood of maintaining reintroductions.
- Ungulate monitoring and control—Protect all occurrences against browsing and disturbances from feral ungulates. Construct and maintain fenced exclosures around existing populations.
- Invasive nonnative plant monitoring and control—Control established ecosystem-altering nonnative invasive plant species, and those that compete with *P. kauaiensis*.
- Human interaction monitoring and management—Develop and implement effective measures to reduce the threat of fire.
- Site and habitat protection—Develop and implement effective control measures to reduce the impact of ungulates.
- Fire prevention and control—Continue to develop and implement fire prevention management plans.

- Climate change adaptation strategy—Research suitability of habitat for reintroduction of this species in the future due to the impacts of climate change, including landslides.
- Captive propagation for genetic storage and reintroduction—Establish collection and propagation efforts for maintenance of genetic stock and for reintroduction.
- Reintroduction and translocation—Reintroduce individuals into suitable habitat within historic range that is being managed for known threats to this species to build resiliency and redundancy to reduce impacts of climate change, stochastic events, and reduced viability due to low numbers.
- Population biology research—
 - Determine which species may act as pollinators and which may assist with fruit dispersal.
 - Conduct genetic studies to determine genetic variation within the population and plan an effective breeding program.
- 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.

Nagendra, U., M. Kahokulua, Jr., and S. Umetsu. 2021. Limahuli Preserve rare plant conservation collections and habitat restoration project, National Tropical Botanical Garden, FWS Agreement #F18AC00508, October 1, 2020-September 30, 2021. 21 pp.

[NTBG] National Tropical Botanical Garden. 2018. NTBG database herbarium specimen detail for *Pteralyxia kauaiensis*. Specimen number 082380, 14 AUG 2018.

[NTBG] 2020a. NTBG database herbarium specimen detail for *Pteralyxia kauaiensis*. Specimen number 082015, 13 AUG 2020.

[NTBG] 2020b. NTBG database herbarium specimen detail for *Pteralyxia kauaiensis*. Specimen number 083504, 18 AUG 2020.

[NTBG] 2020c. NTBG database herbarium specimen detail for *Pteralyxia kauaiensis*. Specimen number 082731, 2 DEC 2020.

[NTBG] 2021. 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] U.S. Fish and Wildlife Service. 2010. *Pteralyxia kauaiensis* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. https://ecos.fws.gov/docs/tess/species_nonpublish/1617.pdf.
- [USFWS] 2017. *Pteralyxia kauaiensis* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. https://ecos.fws.gov/docs/tess/species_nonpublish/2500.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.

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SIGNATURE PAGE for 5-YEAR REVIEW of *Pteralyxia kauaiensis* (kaulu)

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_____