5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Vigna o-wahuensis* (no common name)

Current Classification: Endangered

Federal Register Notice announcing initiation of this review:

[USFWS] U.S. Fish and Wildlife Service. 2023. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status reviews for 133 Species in Oregon, Washington, Idaho, Montana, California, Hawaii, Guam, and the Northern Mariana Islands . Federal Register 88(56): 17611–17614, March 23, 2023.

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 *Vigna o-wahuensis* (USFWS 2020). 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/8445*).

Review Analysis:

Please refer to the previous 5-year reviews for *Vigna o-wahuensis* published in the Federal Register on September 11, 2011 (available at *https://ecos.fws.gov/docs/tess/species_nonpublish/1817.pdf*), August 20, 2015 (available at *https://ecos.fws.gov/docs/tess/species_nonpublish/2300.pdf*), and September 30, 2020 (available at *https://ecos.fws.gov/docs/tess/species_nonpublish/3182.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 *V. o-wahuensis*.

This short-lived perennial vine or twining herb in the Fabaceae (pea) family is endangered and found on the islands of Hawai‘i, Maui, Kaho‘olawe, and Moloka‘i, with historic occurrences on Lāna‘i, O‘ahu, and Ni‘ihau. The current status and trends for *Vigna o-wahuensis* are provided in the tables below.

New Status Information:

- Currently, there is one wild population with 150 individuals on the island of Hawai‘i at Nohona o Hae, and of these, 13 are mature and 137 are immature plants (U.S. Army Garrison–Hawai‘i [USAG-HI] 2024). On Maui, there are 23 wild individuals distributed across three populations, and of these 18 are mature and 5 are immature plants (PEPP 2024). At the time of the last 5-year review in 2020, there were 12 wild individuals in two populations on Moloka‘i, and one wild individual on Kaho‘olawe. The current status of the Moloka‘i populations is unknown. The Kaho‘olawe population was collected in 2002 and outplanted, however, none of the outplants survived and currently no wild populations are known to exist on Kaho‘olawe (Bruch 2025, in litt.).
- There are 120 founder lines represented in *ex situ* storage and propagation collections, including seeds in seed banks and plants in a nursery or living collection (National Tropical Botanical Garden [NTBG] 2023; Maui Nui Botanical Garden [MNBG] 2023; Volcano Rare Plant Propagation Facility [VRPPF] 2024; USAG-HI 2024; Lyon Arboretum 2024).

New Threats:

- None

New Management Actions:

- Monitoring and surveys—PEPP monitors wild occurrences and reintroduced individuals of *Vigna o-wahuensis* on the island of Hawai‘i and wild individuals on Maui (PEPP 2023, 2024).
- Control of non-native plants—USAG-HI conducts non-native plant control around wild and reintroduced populations on the island of Hawai‘i (USAG-HI 2024).
- Collection and propagation for genetic storage and reintroduction—
    - The Lyon Seed Conservation Laboratory reported 682 seeds in storage from four founders, and approximately 6,000 seeds in storage from cultivated plants Lyon Arboretum 2024).
    - MNGB reported hundreds of seeds in storage from cultivated plants from a founder on Maui (MNBG 2023).
    - NTBG reported approximately 400 seeds in storage from cultivated plants (NTBG 2023).
    - USAG-HI reported approximately 3,900 seeds in storage from 120 founders and over 32,300 seeds in storage from cultivated plants (USAG-HI 2024).
    - VRPPF reports 6 plants in propagation representing 6 founders (VRPPF 2024).
- Reintroduction/ Augmentation/ Introduction—From 2003–2019, USAG-HI reintroduced 109 outplants at six locations near Pōhakuloa Training Area on island of Hawai‘i. None of these individuals remained following monitoring in 2022. In 2023 and 2024, a total of 84 individuals were reintroduced at two locations near Pōhakuloa Training Area on island of Hawai‘i (USAG 2024).
- Research—In 2023, the Army Natural Resources Program on Oah‘u [ANRPO] conducted germination trials for 459 seeds in storage representing 10 founders.

The average germination rate for these seeds, which were in storage for over 10 years, was over 90% (USAG-HI 2024).

Table 1. Status and trends of *Vigna o-wahuensis* 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?
1994 (Listing)	10 (Hawai‘i) 20 (Kaho‘olawe) 1 (Lanai) 10 (Moloka‘i)	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)	40 (Hawai‘i) 12–20 (Maui) 12 (Moloka‘i)	>200	All threats managed in all 3 populations	Partial
			Complete genetic storage	Partial
			3 populations with 50 mature individuals each	No
2015 (5-year review)	200–300 (Hawai‘i) 1(Kaho‘olawe) 10 (Maui) 12 (Moloka‘i)	78	All threats managed in all 3 populations	Partial
			Complete genetic storage	Partial
			3 populations with 50 mature individuals each	Partial

Table 1b.

Date	No. wild individuals	No. outplanted	*Preventing Extinction Targets identified by HPPRCC	*Preventing Extinction Targets Completed?
2020 (5-year review)	180–500 (Hawai‘i) <10 (Maui) 12 (Moloka‘i)	ca 5 (>600 outplanted)	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially
			Natural reproduction at all 3 populations	Partially
			3 populations with 50 mature individuals each	Partially
2025 (5-year review)	150 (Hawai‘i) 23 (Maui) Unknown on Moloka‘i	84	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially
			Natural reproduction at all 3 populations	Partially
			3 populations with 50 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 *Vigna o-wahuensis* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Degradation and destruction of habitat by feral ungulates	A,C, D	Ongoing	Partial, two populations within exclosures
Established ecosystem altering invasive plant species degradation of habitat	A, E	Ongoing	Partial, nonnative plant management at two populations
Drought destruction and degradation of habitat	A	Ongoing	Partial; water catchment
Climate change degradation or loss of habitat, including hurricanes	A	Ongoing	None
Predation and herbivory by rats	C	Ongoing	None
Predation and herbivory by invertebrates—Slugs, snails, black twig borer	C	Ongoing	None
Game bird predation	C	Ongoing	None

Synthesis:
Currently there are 150 wild individuals (13 mature and 137 immature) of *Vigna o-wahuensis* on the island of Hawai‘i, 23 wild individuals (18 mature and 5 immature) on the island of Maui, and an unknown number of individuals on Moloka‘i. Individuals are provided protection by fencing and nonnative plant control. Seed collections, propagation, and outplanting are ongoing.

Stabilizing (interim) and preventing extinction targets, and downlisting, and delisting criteria are provided in the Recovery Plan for the Multi-Island Plants (USFWS 1999), and 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.

Vigna o-wahuensis is s 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 the islands (Hawai‘i, Maui, Moloka‘i, Lāna‘i, O‘ahu, Kaho‘olawe) where they now occur or occurred historically and each of these populations must be naturally reproducing (i.e., viable seeds, seedlings, saplings) 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 partially complete (Table 1), there is only a single populations totaling at least 50 mature and reproducing individuals, and all threats are not being managed (Table 1, Table 2). Therefore, *Vigna o-wahuensis* 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 2020. Thus, the following recommendations for future actions are updated or reiterated for the 5-year review for 2025.

- Surveys and monitoring—
  - Continue to monitor known populations of *Vigna o-wahuensis* to assess resiliency and make collections.
  - Continue surveys for populations of *V. o-wahuensis* in areas of potentially suitable habitat.
  - Determine suitable locations for additional 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 *V. o-wahuensis*.
- Site and habitat protection—Develop and implement effective control measures to reduce the impact of game bird predation and destruction of habitat.
- 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.
- Predator and herbivore monitoring and control—Determine and implement effective methods to control insect pests, 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 non-native plants and drought.
- Research—Conduct genetic studies to determine genetic variation within the population (and between populations), determine hybridization, 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:

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[MNBG] Maui Nui Botanical Garden. 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, Hawai‘i.

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[PEPP] Plant Extinction Prevention Program. 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 F14AC00174, December 24, 2016, UH Mānoa, PCSU, PEPP. 74 pp.

[PEPP] 2024. Plant Extinction Prevention Program FY 2023 annual report Oct 1, 2023-Sep 30, 2024), USFWS CFDA Program #15.657, Endangered Species Conservation-Recovery Implementation Funds, Coop Agreement F14AC00174, December 24, 2016, UH Mānoa, PCSU, PEPP. 56 pp.

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[VRPPF] Volcano Rare Plant Propagation Facility. 2024. 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.

U.S. FISH AND WILDLIFE SERVICE
SIGNATURE PAGE for 5-YEAR REVIEW of *Vigna o-wahuensis* (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 Reclassify from Endangered to Threatened status
_____ No Change in listing status

For **Field Supervisor, Pacific Islands Fish and Wildlife Office**

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