

5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Lobelia niihauensis* (no common name)

Current Classification: Endangered

Federal Register Notice announcing initiation of this review:

[USFWS] U.S. Fish and Wildlife Service. 2019. Endangered and threatened wildlife and plants; initiation of 5-year status reviews for 91 species in Oregon, Washington, Hawaii, and American Samoa. Federal Register 84(112): 27152–27154, June 11, 2019.

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) beginning in October 2020. The review was based on a review of current, available information since the last 5-year review for *Lobelia niihauensis* (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 (http://ecos.fws.gov/tess_public).

Review Analysis:

Please refer to the previous 5-year reviews for *Lobelia niihauensis* in the Federal Register on August 2, 2011 and September 16, 2017 (available at https://ecos.fws.gov/docs/tess/species_nonpublish/1740.pdf and https://ecos.fws.gov/docs/tess/species_nonpublish/2462.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 *L. niihauensis*.

This short-lived perennial shrub in the Campanulaceae (bellflower) family is endangered and occurs on the islands of Kaua‘i and O‘ahu and is historically known from Ni‘ihau. The status and trends for *Lobelia niihauensis* are provided in the tables below.

New Status Information:

- In 2012, critical habitat was designated on O‘ahu for *Lobelia niihauensis* in 11 units in the lowland mesic and dry cliff ecosystems (2,960 hectares [ha], 7,312 acres [ac]) (77 FR 57648, September 18, 2012). Critical habitat as designated on Kaua‘i in 2003 remains the same (68 FR 9116, February 27, 2003).
- Currently, there is a total of approximately 400 individuals of *L. niihauensis* on Kaua‘i and O‘ahu, combined (Keir 2018).

New Threats:

- None reported.

New Management Actions:

- Rodent control—The Army’s Natural Resources Program (ANRP) recently expanded the rat control within the Mākaha management unit (ANRP 2020, p. 200).
- Collection and propagation for genetic storage and reintroduction—
 - The ANRP reported storage of 5,300 seeds representing two founders at Mākaha (O‘ahu) for use by the County’s Board of Water Supply (ANRP 2020).
 - In 2020, the Lyon Arboretum Seed Conservation Laboratory reported storage of more than 67,000 seeds representing two founders from Kaua‘i (with an additional 62,000 seeds to be available for research use) and more than 3,000 seeds in storage from one founder on O‘ahu (Lyon Arboretum 2020).
 - The State’s rare plant facility at Kōke‘e (Kaua‘i) reported 10 plants propagated representing two founders from Kaua‘i (Kōke‘e RPF 2020).
 - In 2017, the National Tropical Botanical Garden (NTBG) on Kaua‘i reported propagation of four plants, collection of 72 seeds, and 37 outplanted individuals from propagules taken from one plant in their living collection that was sourced from Pōhakuao, Kaua‘i. In 2018, 462 seeds were collected and stored from another plant in their living collection, also sourced from Pōhakuao (NTBG 2020).

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

Date	No. wild individuals	No. outplanted	Downlisting Criteria identified in Recovery Plan	Downlisting Criteria Completed?
1991 (listing)	400–1,400 (Kaua‘i + O‘ahu)	0	All threats managed in all 5–7 populations	No
			Naturally reproducing, stable or increasing in number, and persisting for 5 consecutive years	Unknown

			5–7 populations with 100 mature individuals each	Unknown
1998 (recovery plan)	960–2,900 (Kaua‘i) 718–753 (O‘ahu)	0	All threats managed in all 5–7 populations	No
			Naturally reproducing, stable or increasing in number, and persisting for 5 consecutive years	Unknown
			5–7 populations with 100 mature individuals each	Unknown
2003 (critical habitat)	284–2,134 (Kaua‘i) 362–397 (O‘ahu)	0	All threats managed in all 5–7 populations	No
			Naturally reproducing, stable or increasing in number, and persisting for 5 consecutive years	Unknown
			5–7 populations with 100 mature individuals each	Unknown
2011 (5-year review)	1,170 (Kaua‘i) 350–475 (O‘ahu)		All threats managed in all 5–7 populations	Partially
			Naturally reproducing, stable or increasing in number, and persisting for 5 consecutive years	Unknown
			5–7 populations with 100 mature individuals	Partially
2012 (critical habitat-O‘ahu)	ca 400 (O‘ahu)	0	All threats managed in all 5–7 populations	Partially
			Naturally reproducing, stable or increasing in number, and persisting for 5 consecutive years	Unknown

			5–7 populations with 100 mature individuals	Partially
Date	No. wild individuals	No. outplanted	*Preventing Extinction Criteria identified by HPPRCC	*Preventing Extinction Criteria Completed?
2017 (5-year review)	ca 100 (Kaua'i) ca 280 (O'ahu)	0	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially
			Natural reproduction at all 3 populations	Unknown
			3 populations with 50 mature individuals each	Partially
2021 (5-year review)	ca 400 (Kaua'i + O'ahu)	0	All threats managed in all 3 populations	Partially, ungulate and nonnative plant management in one location on O'ahu
			Complete genetic storage	Partially, a few founders represented from Kaua'i and O'ahu
			Natural reproduction at all 3 populations	None reported
			3 populations with 50 mature individuals each	Unknown

* 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 *Lobelia niihauensis* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Degradation and destruction of habitat by feral ungulates	A	Ongoing	Partial, O‘ahu population in ANRP management unit
Established ecosystem altering invasive plant species degradation of habitat	A	Ongoing	Partial, nonnative plant control in ANRP management unit, O‘ahu
Degradation and destruction by landslides	A	Ongoing	None
Predation and herbivory by feral ungulates	C	Ongoing	Partial, O‘ahu population in ANRP management unit
Predation and herbivory by rats	C	Ongoing	Partial, O‘ahu population in ANRP management unit
Predation and herbivory by invertebrates	C	Ongoing	None
Human disturbance—Fire from military training and other disturbance	E	Ongoing	Partial, fire breaks and fuel load control within Army training areas on O‘ahu
Reduced viability due to low numbers	E	Ongoing	Partial, seed collection and propagation
Climate change, including hurricanes	E	Ongoing	None

Synthesis:

Currently, on Kaua‘i and O‘ahu, *Lobelia niihauensis* totals an estimated 400 wild individuals. Seed collections are ongoing and a few founders from Kaua‘i and O‘ahu are represented. Ungulate, nonnative plant, and invertebrate control are conducted in a management unit on O‘ahu.

Stabilizing (interim), downlisting, and delisting objectives were 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.

Lobelia niihauensis is currently evaluate as a short-lived perennial shrub. 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 and/or 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. This species has been described as monocarpic (Rock 1919), and there are species that display monocarpic life histories within the genus. However, more observations of the life history of *L. niihauensis* are needed to confirm whether the number of reproducing individuals per population should increase to incorporate any amount of monocarpic behavior.

The preventing extinction goals for this species have not been met. There are an estimated total of 400 wild individuals on Kaua‘i and O‘ahu, and numbers continue to decline. No regeneration has been observed. There is limited genetic representation for populations on both islands (Table 1). Not all threats are being addressed (Table 2). Therefore, *Lobelia niihauensis* meets the definition of Endangered as it remains in danger of extinction throughout its range.

Recommendations for Future Actions:

We are not aware of any new threats or significant new information regarding the species’ biological status since the last 5-year review in 2017. Thus, the following recommendations for future actions are reiterated for the 5-year review for 2021.

- Surveys and inventories—Continue surveys of current and historical range for a complete assessment of the species’ status.
- Ungulate monitoring and control—Continue to construct exclosures to protect all occurrences from the impacts of feral ungulates, including browsing.
- Invasive plant monitoring and control—Continue control established ecosystem-altering nonnative invasive plant species, and those that compete with *Lobelia niihauensis* at all populations.
- Fire monitoring and control—Implement fire management plan for military training areas and develop and implement fire management plans for populations at other locations.
- Predator and herbivore monitoring and control—Implement effective measures to control rodents and nonnative invertebrates at all populations.
- Captive propagation for genetic storage and reintroduction—Continue collection of genetic resources for storage, propagation, and reintroduction into managed suitable habitat.
- Reintroduction and translocation—
 - Begin reintroductions and augmentations into suitable habitat within historical range in areas that are managed for known threats.

- Increase numbers of populations and individuals to reduce impacts from climate change, including hurricanes, landslides, and declining numbers of populations and individuals.
- Human interaction monitoring and control—Implement effective measures to reduce impacts of human activities.
- Climate change adaptation strategy—Research suitability of habitat for reintroduction of this species in the future due to impacts of climate change.
- Population biology research—Study *L. niihauensis* 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 taxon.

References:

[ANRP] Army Natural Resources Program. 2020. Appendices to the Status report for the Mākua and O‘ahu Implementation Plans, Army Natural Resources Program, O‘ahu, Office of the Vice President for Research and Innovation, University of Hawai‘i. 214 pp.

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Polynesian Ethnology and Natural History, published by Authority of the Trustees, Honolulu. P. 35.

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U.S. FISH AND WILDLIFE SERVICE
SIGNATURE PAGE for 5-YEAR REVIEW of *Lobelia niihauensis*
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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

_____ Date _____