

5-YEAR REVIEW
Short Form Summary
Species Reviewed: *Cyanea lobata* (hāhā)
Current Classification: Endangered

Federal Register Notice announcing initiation of this review:

[USFWS] U.S. Fish and Wildlife Service. 2021. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status reviews for 77 Species in Oregon, Washington, Idaho, and Hawaii. Federal Register 86(120):33726–33728, June 25, 2021.

Lead Region/Field Office:

Region 1/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, Recovery 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 2022. The review was based on a review of current, available information since the last 5-year review for *Cyanea lobata* (USFWS 2018). The evaluation by Cheryl Phillipson, Biologist, was reviewed by Lauren Weisenberger, Plant Recovery Coordinator, and Megan Laut, Recovery 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/ecp/species/5829>).

Review Analysis:

Please refer to the previous 5-year reviews for *Cyanea lobata* published in the Federal Register on August 2, 2011; March 12, 2014; and October 22, 2018 (available at https://ecos.fws.gov/docs/tess/species_nonpublish/1765.pdf, https://ecos.fws.gov/docs/tess/species_nonpublish/2182.pdf, and https://ecos.fws.gov/docs/tess/species_nonpublish/2624.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 *C. lobata*.

This short-lived perennial shrub in the Campanulaceae (bellflower) family is endangered and has two recognized subspecies: *Cyanea lobata* ssp. *baldwinii* is endemic to Lāna‘i and *C. lobata* ssp. *lobata* is endemic to Mauna Kahālāwai (west Maui). The status and trends for *C. lobata* are provided in the tables below.

New Status Information:

- As of 2022, there were five wild individuals of *Cyanea lobata* ssp. *baldwinii* at Lāna‘ihale and Pu‘u A‘ali‘i on Lāna‘i (Maui Plant Extinction Prevention Program [Maui PEPP] 2020, 2022). On Mauna Kahālāwai, there are five wild individuals of *C. lobata* ssp. *lobata*: one at Honokōwai, two at Hā‘ena Nui, one at Honokōhau, and one at Helu (Maui PEPP 2017, 2022).
- Currently, there are three founders (wild plants) from two populations of *C. lobata* ssp. *baldwinii* represented in *ex situ* storage and propagation, and five founders from three populations of *C. lobata* ssp. *lobata* represented in *ex situ* storage and propagation.

New Threats:

- None reported.

New Management Actions:

- Monitoring and surveys—Maui PEPP monitors the populations on Lāna‘i and Maui and Pūlama Lāna‘i monitors the populations on Lāna‘i (Maui PEPP 2019-2022).
- Ungulate monitoring and control—
 - All sites with wild and translocated plants on Lāna‘i are fenced; however, not all deer have been removed from the fenced area at Lanaihale and there are limited ungulate-free areas at ‘Āwehi (Maui PEPP 2022).
 - The Nature Conservancy (TNC) manages Kapunakea Preserve on Mauna Kahālāwai for ungulates. The upper section of the preserve is ungulate-free (TNC 2015).
- Nonnative invasive plant monitoring and control—
 - Maui PEPP controls nonnative invasive plants at the populations on Lāna‘i and Mauna Kahālāwai (Maui PEPP 2018, 2021, 2022).
 - TNC manages invasive nonnative plants within the Kapunakea Preserve (TNC 2015).
- Collection and captive propagation for genetic storage and translocation—
 - In 2020, the Olinda Rare Plant Facility (ORPF) reported propagation and storage of four individuals representing two founders of *C. lobata* ssp. *baldwinii* at Lāna‘ihale and propagation and storage of four plants representing two founders of *C. lobata* ssp. *lobata* at Hā‘ena Nui Gulch (ORPF 2020). In 2021, ORPF reported propagation and storage of 12 plants representing three founders of subspecies *baldwinii* at Lāna‘ihale, and in 2022, propagation and storage of 8 plants representing one founder of subspecies *lobata* at Hā‘ena Nui Gulch (ORPF 2023).
 - In 2022, the Lyon Arboretum’s Micropropagation Laboratory reported storage of 28 explants representing one founder of *Cyanea lobata* ssp. *baldwinii* at Lāna‘ihale (Lyon Arboretum 2022). For *C. lobata* ssp. *lobata*, they reported storage of 66 explants representing two founders at Honokōhau, 85 explants representing one founder at Hā‘ena Nui Gulch, and 38 explants representing one founder at Honokōwai (Lyon Arboretum 2022). Between 2018 and 2021, the Lyon Arboretum’s Seed Conservation Laboratory reported storage of

more than 5,000 seeds representing one founder of *C. lobata* ssp. *baldwinii* at Lāna‘ihale and nearly 4,500 seeds representing a second founder at Lāna‘ihale. The seed bank also maintains collections from five founders of *C. lobata* subsp. *lobata* totaling over 20,000 seeds collected between 2011 and 2017 (Lyon Arboretum 2022).

- Reintroductions, augmentations, translocation—In 2016, eight individuals of *C. lobata* ssp. *baldwinii* were translocated to Pu‘u A‘ali‘i; currently two individuals remain (Maui PEPP 2016-2018). In 2022, five individuals of *C. lobata* ssp. *baldwinii* were translocated to ‘Āwehi (Maui PEPP 2022). In 2019, there were two individuals of *C. lobata* ssp. *lobata* translocated to Waikapū and currently none remain (Maui PEPP 2020). No outplants of *C. lobata* ssp. *lobata* currently survive of the two translocated to Waihe‘e (Maui PEPP 2019, 2022). Of the 16 individuals translocated to Honanana, 6 remain; and 2 translocated individuals remain at Launiupoko (Maui PEPP 2022). In 2023, five individuals were translocated to Pana‘ewa Natural Area Reserve (Maui PEPP 2023).

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

Date	No. wild individuals	No. outplanted	Stability Criteria identified in Recovery Plan	Stability Criteria Completed?
1992 (listing)	4 (Maui)	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)	4 (Maui) 3 (Lāna‘i)	0	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2014 (5-year review)	3 (Maui) 2 (Lāna‘i)	16	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No

Date	No. wild individuals	No. outplanted	*Preventing Extinction Criteria identified by HPPRCC	*Preventing Extinction Criteria Completed?
2018 (5-year review)	3 (Maui) 2 (Lāna‘i)	36 remain	All threats managed in all 3 populations	Partially
			Reproduction (i.e., viable seeds, seedlings) at all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2023 (5-year review)	5 ssp. <i>lobata</i> (Maui) 5 ssp. <i>baldwinii</i> (Lāna‘i)	29 ssp. <i>lobata</i> (Maui), 9 remain; 13 ssp. <i>baldwinii</i> (Lāna‘i), 7 remain	All threats managed in all 3 populations	Partially, all populations within exclosures
			Complete genetic storage	Almost complete
			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 *Cyanea lobata* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Degradation and destruction of habitat by feral ungulates	A	Ongoing	All populations within exclosures
Established ecosystem altering invasive plant species degradation of habitat	A	Ongoing	Partial, nonnative plant control within exclosures
Erosion and drought destruction and degradation of habitat	A	Ongoing	None
Fire destruction and degradation of habitat	A	Ongoing	Partial, fire management program for Kapunakea Preserve
Climate change degradation or loss of habitat	A	Ongoing	None
Predation and herbivory by feral ungulates	C	Ongoing	Lāna‘i populations within exclosures
Predation and herbivory by rodents	C	Ongoing	Partial, rodent control at two Lāna‘i populations
Predation and herbivory by invertebrates	C	Ongoing	None
Reduced viability due to small populations	E	Ongoing	Partial, propagation, seed storage, and translocations and augmentations are ongoing

Synthesis:

Currently there are five wild individuals of *Cyanea lobata* ssp. *lobata* on Mauna Kahālāwai (west Maui) and five wild individuals of *C. lobata* ssp. *baldwinii* on Lāna‘i. All known populations are provided protection by fencing and nonnative plant control. Rodents are controlled at two populations on Lāna‘i. All founders are represented in *ex situ* genetic storage collections. Propagation, and translocations and augmentations are ongoing.

Stabilizing (interim), downlisting, and delisting objectives are provided in the Recovery Plan for the Maui Plant Cluster (U.S. Fish and Wildlife Service 1997) 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.

Cyanea lobata is 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 of each subspecies should be documented on Lāna‘i or Maui 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 *Cyanea lobata* have not been met. Only five wild individuals of ssp. *lobata* and five individuals of ssp. *baldwinii* remain; some of the ssp. *baldwinii* founders are not represented in collections and translocations (Table 1). There are no populations totaling at least 50 reproducing individuals and all threats are not being sufficiently managed throughout the ranges of these subspecies (Table 2). Therefore, *Cyanea lobata* 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 2018. Thus, the following recommendations for future actions are updated or reiterated for the 5-year review for 2023.

- Surveys and inventories—Continue to survey for additional populations of both subspecies of *Cyanea lobata* in areas of potentially suitable habitat.
- Ungulate monitoring and control—Continue to maintain fenced exclosures to protect individuals from the negative impacts of browsing by ungulates and to prevent imminent extinction in the wild.
- Invasive nonnative plant monitoring and control—Continue control of established ecosystem-altering nonnative invasive plant species, and those that compete with both subspecies of *Cyanea lobata*, within and around all populations.
- Fire monitoring and control—Develop and implement fire management plans for all populations.
- Climate change adaptation strategy—Research suitability of habitat for translocation of this species in the future due to the impacts of climate change.
- Predator and herbivore monitoring and control—
 - Protect all occurrences against browsing by feral ungulates to prevent imminent extinction of this species in the wild.
 - Implement effective control methods for rodents within the vicinity of all known populations of both subspecies of *C. lobata*.
 - Develop and implement effective control methods for slugs at all known populations of both subspecies of *C. lobata*.

- Captive propagation for genetic storage and translocation—
 - Continue collection and propagation efforts for maintenance of genetic stock and for translocation.
 - Evaluate genetic resources currently in storage to determine the need to place additional genetic resources into long-term storage due to these subspecies' vulnerability to climate change.
- Translocation and augmentation—Continue to augment populations and reintroduce individuals into suitable habitat that is being managed for known threats to both subspecies.
- Build resiliency, redundancy, and representation—Continue translocation of individuals into suitable habitat that is being managed for known threats to this species to reduce impacts of erosion and drought.
- 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:

[HPPRCC] Hawai‘i 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, Hawai‘i.

[Maui PEPP] Maui Plant Extinction Prevention Program. 2016-2023. Monthly plant species monitoring report. Excel data tables.

[ORPF] Olinda Rare Plant Facility. 2020. 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.

[ORPF] 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.

Pūlama Lāna‘i. 2021. Threatened and Endangered species report for Division of Forestry and Wildlife. Tab 2, population site monitoring, Tab 3, nursery accessions, Tab 4, individual plants and collections. Excel data table, 4 tabs.

[TNC] The Nature Conservancy—Hawai‘i Operating Unit. 2015. Kapunakea Preserve, West Maui, Hawai‘i final long-range management plan fiscal years 2016-2021. Submitted to the Department of Land & Natural Resources Natural Area Partnership Program. 38 pp.

- [USFWS] U.S. Fish and Wildlife Service 1997. Recovery plan for the Maui plant cluster (Hawai'i). Portland. 130 pp. + appendices.
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SIGNATURE PAGE for 5-YEAR REVIEW of *Cyanea lobata* (hāhā)

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 _____