

5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Cyanea glabra* (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 2021. The review was based on a review of current, available information since the last 5-year review for *Cyanea glabra* (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/7981>).

Review Analysis:

Please refer to the previous 5-year reviews for *Cyanea glabra* published in the Federal Register on August 2, 2011, and October 22, 2018 (available at https://ecos.fws.gov/docs/tess/species_nonpublish/1770.pdf and https://ecos.fws.gov/docs/tess/species_nonpublish/2621.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. glabra*.

This short-lived perennial shrub in the Campanulaceae (bellflower) family is endangered and is known from Haleakalā (east Maui). The status and trends for *Cyanea glabra* are provided in the tables below.

New Status Information:

- In 2018, it was determined that individuals initially considered to be *Cyanea glabra* on Mauna Kahālāwai (west Maui) were actually *C. kauaulaensis* and that most of the populations on Haleakalā (east Maui) were actually *C. maritae*. Currently, there are three populations on east Maui still considered to be *C. glabra*, the largest at West Wailua Iki stream of approximately 300 individuals, one new population of two wild individuals at East Wailua Iki stream, and one population of at least seven individuals at Kopili‘ula stream (Maui Plant Extinction Prevention Program [Maui PEPP] 2022, 2023). Most individuals at West Wailua Iki and Kopili‘ula are within fencing constructed on private and State lands for the East Maui Watershed Partnership.
- Currently, there are at least 10 founders (wild plants) (including those reported in the last 5-year review) represented in *ex situ* storage and propagation.

New Threats:

- None reported.

New Management Actions:

- Surveys and monitoring—Maui PEPP surveys for and monitors populations of *Cyanea glabra* on Haleakalā (east Maui) (Maui PEPP 2022, 2023).
- Collection and propagation for genetic storage and reintroduction—
 - In 2022, Maui PEPP reported collection of seeds from eight founders at West Wailua Iki for storage at the Lyon Arboretum Seed Conservation Laboratory (Maui PEPP 2022).
 - In 2020, the Olinda Rare Plant Facility (ORPF) reported storage of seven plants in the nursery propagated in 2013 and representing at least one founder from West Wailua Iki stream (ORPF 2020). In 2022, there were two plants in storage representing one founder from West Wailua Iki (ORPF 2023).
- Translocation and augmentation—Two plants translocated to East Wailua Iki stream in 2016 are extirpated (Maui PEPP 2020).

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

Date	No. wild individuals	No. outplanted	Stability Criteria identified in Recovery Plan	Stability Criteria Completed?
1999 (listing)	235 ¹	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)	Unknown	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			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)	ca 300	1	All threats managed in all 3 populations	No
			Reproduction (i.e., viable seeds, seedlings) at all 3 populations	No
			Complete genetic storage	Partially, 3 percent
			3 populations with 50 mature individuals each	Partially, 1 population >50 individuals
2023 (5-year review)	300+	2, none remain	All threats managed in all 3 populations	Partially, 3 fenced areas
			Complete genetic storage	Partially
			Natural reproduction at all 3 populations	None reported
			3 populations with 50 mature individuals each	Partially, 1 population >50 individuals

¹ Most now known to be *Cyanea kauaulaensis* or *C. maritae*.

* 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 glabra* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Degradation and destruction of habitat by feral ungulates	A	Ongoing	Partial, fencing at West and East Wailua Iki streams and Kopili‘ula stream
Established ecosystem altering invasive plant species degradation of habitat	A	Ongoing	None
Landslides and flooding destruction and degradation of habitat	A	Ongoing	None
Climate change degradation or loss of habitat	A	Ongoing	None
Predation and herbivory by feral ungulates	C	Ongoing	Partial, fencing at West and East Wailua Iki streams and Kopili‘ula stream
Predation and herbivory by rodents	C	Ongoing	None
Predation and herbivory by invertebrates	C	Ongoing	None
Reduced viability due to low numbers	E	Ongoing	Partial, seed storage, propagation, and translocation efforts

Synthesis:

Currently there are a little more than 300 known individuals in three populations, most of which are in one population. Two individuals translocated in 2016 have since died. At least 10 founders are currently represented in collections. All three populations are within fenced areas.

Stabilizing (interim), downlisting, and delisting objectives are provided in the Addendum to the Recovery Plan for the Multi-Island Plants (USFWS 2002) 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 glabra is a short-lived perennial shrub. To prevent extinction, which is the first step 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 Maui where they now occur or occurred historically. Each of these populations must be naturally reproducing (e.g., viable seeds, seedlings) and increasing in number, with a minimum of 50 mature, mature reproducing individuals per population.

The preventing extinction goals for *Cyanea glabra* have not been met. There is only one population totaling more than 50 mature, reproducing individuals (Table 1). Genetic representation is incomplete. All three populations occur within fenced areas; however, other threats including nonnative plants, flooding, climate change, and rodent and invertebrate herbivory are not being managed (Table 1, Table 2). Therefore, *C. glabra* 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 known populations of *Cyanea glabra* to assess their status.
- Ungulate monitoring and control—Continue to construct and maintain exclosures to protect individuals from the negative impacts of habitat destruction and herbivory by feral ungulates.
- Invasive nonnative plant monitoring and control—Control established ecosystem-altering nonnative invasive plant species at all wild and translocated populations.
- Climate change adaptation strategy—Assess the modeled effects of climate change and determine future landscape needed for the recovery of this species.
- Predator and herbivore monitoring and control—
 - Implement effective control methods for rodents at all populations.
 - Develop and implement effective control methods of slug control.
- Captive propagation for genetic storage and reintroduction—Continue collection and propagation efforts for maintenance of genetic stock and for translocation.
- Reintroduction and translocation—Continue translocation of individuals into suitable habitat within historic range that is being managed for known threats.
- 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 landslides and flooding.

- 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.

[Maui PEPP] Maui Plant Extinction Prevention Program. 2020. Monthly Maui Nui plant species status report. Excel table.

[Maui PEPP] 2022. Monthly Maui Nui plant species status report. Excel table.

[Maui PEPP] 2023. Monthly Maui Nui plant species status report. Excel table.

[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.

[USFWS] U.S. Fish and Wildlife Service. 2002. Addendum to the Recovery Plan for the Multi-Island Plants. Portland. 2002. 93 pp. + appendices.

[USFWS] 2011. *Cyanea glabra* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI.
https://ecos.fws.gov/docs/tess/species_nonpublish/1770.pdf.

[USFWS] 2018. *Cyanea glabra* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI.
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[USFWS] 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.

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SIGNATURE PAGE for 5-YEAR REVIEW of *Cyanea glabra* (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 _____