5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Cyanea mannii* (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 mannii* (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/4595*).

Review Analysis:

Please refer to the previous 5-year reviews for *Cyanea mannii* published in the Federal Register on August 2, 2011, and October 23, 2018 (available at*https://ecos.fws.gov/docs/tess/species_nonpublish/1764.pdf* and *https://ecos.fws.gov/docs/tess/species_nonpublish/2626.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. mannii*.

This short-lived perennial shrub in the Campanulaceae (bellflower) family is endangered and endemic to Moloka‘i. The status and trends for *Cyanea mannii* are provided in the tables below.

New Status Information:

- Recently surveyed populations at Mokomoko and Kapuna Springs, including two new populations at Mapulehu and the cliffs of Waiehu, total more than 170 individuals (Bakutis 2023, pers. comm.). Populations not surveyed since 2008 at Waihānau stream, Kawela, Kahanui, Kapulei, Wāwāʻia-Kua, Waianui, Kahuaawi, and Kūpāʻia totaled approximately 130 individuals. If past data is still valid, the total number of individuals of *Cyanea mannii* may be more than 300 individuals on Molokaʻi.
- Currently, there are no founders (wild plants) represented in *ex situ* storage or propagation.

New Threats:

- None reported.

New Management Actions:

- Monitoring and surveys—The Molokaʻi Plant Extinction Prevention Program (MoPEPP) monitors populations of *Cyanea mannii* (Bakutis 2023, pers. comm.).
- Ungulate monitoring and control—Individuals within the Kamalo Kapualei fence unit from Kapulei to Wāwāʻia gulch are provided some protection from ungulates as the area is part of the landscape fencing managed by the East Molokaʻi Watershed Partnership (EMoWP) (EMoWP 2015, p. 11).
- Fire management—The EMoWP supports activities of the Molokaʻi Fire Task Force, the Maui County Fire Department, and the State Division of Forestry and Wildlife Maui District for fire management (EMoWP 2015, p. 14).
- Collection and propagation for genetic storage and translocation—The Olinda Rare Plant Facility (ORPF) reported receiving propagules grown on Maui in 2008; however, there are no records of plants in the nursery or even any after collections received in 2010 and 2012 (ORPF 2020, 2023).

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

Date	No. wild individuals	No. outplanted	Stability Criteria identified in Recovery Plan	Stability Criteria Completed?
1992 (listing)	40	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)	<200	4	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)	64–114	0	All threats managed in all 3 populations	No
			Reproduction (i.e., viable seeds, seedlings, saplings) at all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2023 (5-year review)	172–300+	0	All threats managed in all 3 populations	Partially, 2 populations within exclosures
			Complete genetic storage	No
			Natural reproduction at all 3 populations	Unknown
			3 populations with 50 mature individuals each	Partially, 1 population >50 individuals

* 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 mannii* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Degradation and destruction of habitat by feral ungulates	A	Ongoing	Partial, 2 populations in exclosures
Established ecosystem altering invasive plant species degradation of habitat	A	Ongoing	Partial, 1 population managed
Landslides and flooding destruction and degradation of habitat	A	Ongoing	None
Drought destruction and degradation of habitat	A	Ongoing	None
Fire destruction and degradation of habitat	A	Ongoing	Partial, EMoWP supports fire pre-suppression activities
Climate change degradation or loss of habitat	A	Ongoing	None
Predation and herbivory by feral ungulates	C	Ongoing	Partial, 2 populations in exclosures
Predation and herbivory by rats and invertebrates	C	Ongoing	None
Inadequacy of existing regulatory mechanisms—Lack of adequate hunting regulations	D	Ongoing	Partial, 2 populations in exclosures
Reduced viability due to low numbers	E	Ongoing	None

Synthesis:
Currently, there are four recently surveyed subpopulations of *Cyanea mannii* totaling more than 170 wild individuals. Eight other populations may total more than 130 individuals; however, their current status is not known. Together, the 12 subpopulations may total more than 300 individuals. The plants at Kawela and Wāwāʻia-Kapulei are within exclosures. There have been no genetic resources collected or propagated since 2012 and none reported in storage.

Stabilizing (interim), downlisting, and delisting objectives are provided in the Recovery Plan for the Molokaʻi Plant Cluster (USFWS 1996) and have been updated according to the draft revised recovery objective guidelines developed by the Hawaiʻi 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 mannii 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 should be documented on Molokaʻi where they now occur or occurred historically. 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 this species have not been met. There is only one population of at least 50 reproducing individuals and no current *ex situ* collections, propagation, or translocation (Table 1). Two populations are within exclosures; however, not all threats are being managed throughout the range of the species including drought, landslides, and predation (Table 2). Therefore, *Cyanea mannii* 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 monitoring—Continue to survey for additional populations of *Cyanea mannii* in areas of potentially suitable habitat. Regularly monitor known populations.
- Ungulate monitoring and control—Continue to construct and maintain exclosures to protect individuals from the negative impacts of habitat destruction and degradation, and herbivory, by feral ungulates.
- Invasive nonnative plant monitoring and control—Control established ecosystem-altering nonnative invasive plant species, and those that compete with *C. mannii*, around all populations.
- Fire monitoring and control—Implement fire management plans for all known populations.
- Climate change adaptation strategy—Assess the modeled effects of climate change on this species to determine future landscape needed for its recovery.
- Predator and herbivore monitoring and control—
    - Implement effective control methods for rodents at all populations.
    - Develop and implement effective control methods for slugs at all populations.

- Captive propagation for genetic storage and reintroduction—Resume collection and propagation efforts for maintenance of genetic stock and for translocation.
- Reintroduction and translocation—Begin translocation of individuals into suitable habitat within historic range that is being managed for known threats to this species.
- Build resiliency, redundancy, and representation—Increase numbers of populations and individuals throughout historic range to reduce impacts of landslides, drought, predation, and low numbers.
- 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:

Bakutis, A. 2023, pers. comm. Molokaʻi Plant Extinction Prevention Program udpates for plant species endemic to Molokaʻi. 31 MAY 2023.

[EMoWP] East Molokaʻi Watershed Partnership. 2015. East Molokaʻi Watershed Partnership 2020 management action plan, fiscal years 2016-2020 (July 2015-June 2020), EMoWP, coordinated by The Nature Conservancy Molokaʻi Program, June 30. 69 pp.

[HPPRCC] Hawaiʻi and Pacific Plants Recovery Coordinating Committee. 2011. Revised recovery objective guidelines. 8 pp.

[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, Hawaiʻi.

[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, Hawaiʻi.

[USFWS] U.S. Fish and Wildlife Service. 1996. Recovery Plan for the Molokaʻi Plant Cluster

[USFWS] 2011. *Cyanea mannii* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. *https://ecos.fws.gov/docs/tess/species_nonpublish/1764.pdf.*

[USFWS] 2018. *Cyanea mannii* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. *https://ecos.fws.gov/docs/tess/species_nonpublish/2626.pdf.*

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SIGNATURE PAGE for 5-YEAR REVIEW of *Cyanea mannii* (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
___X___ No Change in listing status

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

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