5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Cyanea gibsonii* (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 gibsonii* (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/4024*).

Review Analysis:

Please refer to the previous 5-year reviews for *Cyanea gibsonii* published in the Federal Register on January 18, 2008; March 12, 2014; and October 22, 2018 (available at *https://ecos.fws.gov/docs/tess/species_nonpublish/1146.pdf*, *https://ecos.fws.gov/docs/tess/species_nonpublish/2183.pdf*, and *https://ecos.fws.gov/docs/tess/species_nonpublish/2620.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. gibsonii*.

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

New Status Information:

- As of 2022, there were three populations (Puʻualiʻi, Lānaʻihale-Hauola) on Lānaʻi totaling 31 mature and 20 immature individuals (Maui Plant Extinction Prevention Program (Maui PEPP 2019–2022; Pūlama Lānaʻi 2021). Augmentations were attempted at Puʻualiʻi, but none survive (Maui PEPP 2019–2022). There is one translocated plant in a fenced area at ʻĀwehi (Maui PEPP 2019–2022).
- Currently, there are 15 founders (wild plants) represented in *ex situ* storage and propagation.

New Threats:

- None reported.

New Management Actions:

- Monitoring and surveys—Maui PEPP and Pūlama Lānaʻi monitor the populations (Maui PEPP 2019-2022; Pūlama Lānaʻi 2019).
- Ungulate monitoring and control—All sites with wild, augmented, and reintroduced plants are fenced (Pūlama Lānaʻi 2021).
- Collection and propagation for genetic storage and translocation—
    - In 2019, the Olinda Rare Plant Facility (ORPF) reported propagation of 22 plants representing 9 founders from Lānaʻihale with 3 sent out for translocation (ORPF 2019). In 2021-2022, ORPF reported propagation of two plants representing an additional two founders at Lānaʻihale (ORPF 2023).
    - The Lyon Arboretum's Micropropagation Laboratory reported storage of 108 explants representing one founder at Lānaʻihale (Lyon Arboretum 2022). The Lyon Arboretums Seed Conservation Laboratory reported storage of seeds collected between 2011 and 2021 from two founders at Puʻualiʻi (10,276 seeds) and 10,653 seeds from 6 founders at one population at Lānaʻihale-Hauola and 5,902 seeds from 7 founders at a second population at Lānaʻihale (Lyon Arboretum 2022).
    - Pūlama Lānaʻi reported storage of 260 fruit collected from one founder at Puʻualiʻi and from 7 founders at Lanaʻihale (Pūlama Lānaʻi 2021). One cutting was taken from one founder at Lanaʻihale (Pūlama Lānaʻi 2021).
- Reintroductions, augmentations, translocation—Two individuals were translocated to Puʻualiʻi but did not survive as of 2018 and 2021; one individual translocated to ʻĀwehi survived in 2022 (Maui PEPP 2019-2022).

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

Date	No. wild individuals	No. outplanted	Stability Criteria identified in Recovery Plan	Stability Criteria Completed?
1991 (listing)	1	0	All threats managed in all 3 populations	No

			Complete genetic storage	No
			3 populations with 25 mature individuals each	No
2008 (5-year review)	10–20	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 25 mature individuals each	No
2014 (5-year review)	10	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 25 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 24	None remain	All threats managed in all 3 populations	No
			Reproduction (i.e., viable seeds, seedlings, saplings) at all 3 populations	No
			Complete genetic storage	Yes
			3 populations with 25 mature individuals each	No
2023 (5-year review)	31 mature 20 immature	1	All threats managed in all 3 populations	Partially, all populations within exclosures
			Complete genetic storage	Partially, 15 founders represented

			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 gibsonii* 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
Landslides and flooding destruction and degradation of habitat	A	Ongoing	None
Climate change degradation or loss of habitat including hurricanes	A	Ongoing	None
Predation and herbivory by feral ungulates	C	Ongoing	All populations within exclosures
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, propagation, seed storage, and translocations and augmentations are ongoing

Synthesis:
Currently there are 31 mature and 20 immature wild individuals of *Cyanea gibsonii* in three populations on Lānaʻi. Individuals are provided protection by fencing and nonnative plant control. Seed collections, propagation, and translocations and augmentations are ongoing, representing 15 of the 51 known founders.

Stabilizing (interim), downlisting, and delisting objectives are provided in the Lānaʻi Plant Cluster Recovery Plan (U.S. Fish and Wildlife Service 1995) 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 gibsonii 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 Lānaʻi 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 this species have not been met. Only 15 of the 5` known founders from three populations are represented in collections (Table 1). There are no single populations totaling at least 50 reproducing individuals, and all threats are not being sufficiently managed throughout the range of the species (Table 2). Therefore, *Cyanea gibsonii* 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 reiterated for the 5-year review for 2023.

- Surveys and inventories—Continue to survey for additional populations of *Cyanea gibsonii* 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.
- Invasive nonnative plant monitoring and control—Continue control of established ecosystem-altering nonnative invasive plant species, and those that compete with *C. gibsonii*, within and around exclosures.
- Climate change adaptation strategy—Research suitability of habitat for translocation of this species in the future due to the impacts of climate change. Additional management actions may be needed, such as locating key microsites that overlap with current and future climate envelopes for translocation efforts. As this species is likely to "wink out" by 2100 due to the effects of climate change, ensure that adequate storage of viable genetic materials is maintained.
- 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 and slugs within the vicinity of all known *C. gibsonii* populations

- Captive propagation for genetic storage and reintroduction—
  - Continue collection and propagation efforts for maintenance of genetic stock and for translocation.
  - Continue to translocate individuals into suitable habitat within historic range that is being managed for known threats to this species.
- 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, flooding, and hurricanes.
- 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.

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[MNBG] Maui Nui Botanical Garden. 2021. 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. 2022. Species monitoring report, August, 2022. Excel data table.

Morden, C.W., B. Davis, and M. Yorkston. 2018. Investigating genetic variation in *Abutilon menziesii* (Malvaceae) populations from the Hawaiian Islands using SRAP markers. A component of the project: Hawaii & Kauai: Molecular genetics to inform conservation planning. Pacific Cooperative Studies Unit, Department of Botany, University of Hawaii at Manoa, Honolulu, pp. 43–60 *In* Department of Land and Natural Resources Division of Forestry and Wildlife. 2019. Section 6 Performance Report, Hawaii Statewide Rare Plant Program, Grant number F16AF00882, Performance Period: July 1, 2018—June 30, 2019, Hawaii. 192 pp.

[ORPF] Olinda Rare Plant Facility. 2019. 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. 2019. Consolidated annual report for 2016, 2017, 2018 to the US Fish & Wildlife Service as required by the Memorandum of Understanding dated January 26, 2015 between USFWS & Pūlama Lāna‘i, 8 pp.

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.

[USFWS] U.S. Fish and Wildlife Service 1995. Lāna‘i Plant Cluster Recovery Plan. Portland, OR. 136 pp. + appendices.

[USFWS] 2008. *Cyanea gibsonii* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. *https://ecos.fws.gov/docs/tess/species_nonpublish/1146.pdf.*

[USFWS] 2014. *Cyanea gibsonii* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. *https://ecos.fws.gov/docs/tess/species_nonpublish/2183.pdf.*

[USFWS] 2018. *Cyanea gibsonii* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. *https://ecos.fws.gov/docs/tess/species_nonpublish/2620.pdf.*

[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.

U.S. FISH AND WILDLIFE SERVICE
SIGNATURE PAGE for 5-YEAR REVIEW of *Cyanea gibsonii* (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**

LAUREN WEISENBERGER Digitally signed by LAUREN WEISENBERGER Date: 2023.08.17 18:26:34 -10'00'

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