

## 5-YEAR REVIEW

### Short Form Summary

**Species Reviewed:** *Cyanea grimesiana* ssp. *grimesiana* (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 grimesiana* ssp. *grimesiana* (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/851>).

#### **Review Analysis:**

Please refer to the previous 5-year reviews for *Cyanea grimesiana* ssp. *grimesiana* published in the Federal Register on August 2, 2011, and October 10, 2018 (available at [https://ecos.fws.gov/docs/tess/species\\_nonpublish/1768.pdf](https://ecos.fws.gov/docs/tess/species_nonpublish/1768.pdf) and [https://ecos.fws.gov/docs/tess/species\\_nonpublish/2622.pdf](https://ecos.fws.gov/docs/tess/species_nonpublish/2622.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. grimesiana* ssp. *grimesiana*.

This short-lived perennial shrub in the Campanulaceae (bellflower) family is endangered and is known from the islands of O‘ahu and Moloka‘i. The status and trends for *Cyanea grimesiana* ssp. *grimesiana* are provided in the tables below.

#### New Status Information:

- Currently, there are no known wild individuals on O‘ahu or Moloka‘i. Since 2018, approximately 350 individuals were translocated to seven locations on O‘ahu with 230 currently surviving.
- Currently, all three founders (wild plants) from two populations on O‘ahu are represented in *ex situ* storage and propagation.

#### New Threats:

- None reported.

#### New Management Actions:

- Monitoring and surveys—The Plant Extinction Prevention Program (PEPP) surveys for and monitors wild and translocated populations of *Cyanea grimesiana* ssp. *grimesiana*.
- Ungulate monitoring and management—Translocation sites are fenced and monitored for ungulate incursion (Portner 2012; Ching-Harbin et al. 2016; Ching-Harbin et al. 2021).
- Invasive nonnative plant management—In 2021, PEPP conducted nonnative plant control at reintroduction sites (Ching-Harbin et al. 2021; PEPP 2021, p. 17; Togikawa et al. 2021).
- Control of predation and herbivory by rodents—In 2019, PEPP deployed and monitored rat traps at the Mānoa Cliffs restoration area (PEPP 2019, pp. 61–62; PEPP 2021, p. 17).
- Control of predation and herbivory by slugs—In 2021, PEPP reported application of molluscicides to protect translocations of *C. grimesiana* ssp. *grimesiana* (PEPP 2021, pp. 8, 17).
- Collection and propagation for genetic storage and reintroduction—
  - Collections of fruit from translocated plants at Mānoa Cliffs restoration site are sent to Lyon Arboretum (Lyon Arboretum 2022).
  - In 2021, the Lyon Micropropagation Laboratory reported propagation of 394 explants representing one founder at Kului, three translocated plants at Mānoa Cliffs, and one founder at Pia Valley (Lyon Arboretum 2022). In 2018, the Lyon Arboretum Seed Conservation Laboratory reported storage of 43 seeds representing one translocated individual at Mānoa Cliffs (Lyon Arboretum 2022). Thousands of seeds are in storage resulting from an experimental breeding program with translocated plants (Lyon Arboretum 2022).
  - In 2019, the State’s rare plant nursery at Pahole reported propagation of 47 individuals representing one translocated plant at Poamoho, propagation of 104 individuals representing one translocated individual at Mānoa Cliffs, and in 2020, reported propagation of eight plants representing two translocated plants at Mānoa Cliffs. In 2019, the Pahole rare plant nursery also reported propagation of 11 individuals resulting from various crossings between plants at Maunawili and Mānoa. In 2022, the State’s rare plant nursery at Waimano reported propagation of five plants representing one translocated individual at Mānoa Cliffs (O‘ahu Rare Plant Facilities [O‘ahu RP] 2022).

- Pahole Nursery conducts cross-pollinations between plants from Mānoa and Maunawili for production of more viable seeds to use for propagation and translocation efforts (O‘ahu RP 2022).
- Translocation and Augmentation—
  - Between 2018 and 2021, 140 individuals of *Cyanea grimesiana* ssp. *grimesiana* were translocated to Kipapa, with 123 currently remaining (Harmon and Beiseley 2018; Harmon et al. 2019; Togikawa and Lum 2020; Ching-Harbin et al. 2021); in 2018, 10 healthy outplants remained at Poamoho, but by 2020 only 5 were healthy (Togikawa et al. 2020a); in 2020, six healthy plants remained at a second site in Poamoho (Togikawa et al 2020b); and in 2021, 12 immature individuals were translocated to a third site at Poamoho (Togikawa et al 2021). In 2019, 113 individuals were translocated to Kaluaa Gulch (PEPP 2019, pp. 20, 23). In 2021, PEPP added 89 plants to reintroduction sites at Mānoa Cliffs and Poamoho (PEPP 2021, p. 10).

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

<b>Date</b>	<b>No. wild individuals</b>	<b>No. outplanted</b>	<b>Stability Criteria identified in Recovery Plan</b>	<b>Stability Criteria Completed?</b>
1996 (listing)	<50	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)	0	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
<b>Date</b>	<b>No. wild individuals</b>	<b>No. outplanted</b>	<b>*Preventing Extinction Criteria identified by HPPRCC</b>	<b>*Preventing Extinction Criteria Completed?</b>
2018 (5-year review)	0	<50	All threats managed in all 3 populations	No
			Reproduction (i.e., viable seeds, seedlings) at all 3 populations	No

			Complete genetic storage	Yes
			3 populations with 50 mature individuals each	No
2023 (5-year review)	0	ca 350, ca 230 survive (O‘ahu)	All threats managed in all 3 populations	Partially
			Complete genetic storage	Yes
			Natural reproduction at all 3 populations	None reported
			3 populations with 50 mature individuals each	Partially, 2 translocated populations >50 on O‘ahu, no recruitment

\* 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 grimesiana* ssp. *grimesiana* and ongoing conservation efforts.**

<b>Threat</b>	<b>Listing factor</b>	<b>Current Status</b>	<b>Conservation/ Management Efforts</b>
<b>Degradation and destruction of habitat by feral ungulates</b>	A	Ongoing	All translocated populations within exclosures
<b>Established ecosystem altering invasive plant species degradation of habitat and competition</b>	A, E	Ongoing	Nonnative plant control within exclosures
<b>Landslides and flooding destruction and degradation of habitat</b>	A	Ongoing	None
<b>Climate change degradation or loss of habitat</b>	A	Ongoing	None
<b>Predation and herbivory by feral ungulates</b>	C	Ongoing	All translocated populations within exclosures
<b>Predation and herbivory by rodents</b>	C	Ongoing	Partial, traps set and monitored at 1 translocation site
<b>Predation and herbivory by invertebrates</b>	C	Ongoing	Partial, some slug control implemented
<b>Reduced viability due to low numbers</b>	E	Ongoing	Partial, seed storage, propagation, cross pollination, augmentation and translocation efforts are ongoing

**Synthesis:**

Currently there are no known wild individuals of *Cyanea grimesiana* ssp. *grimesiana* on O‘ahu or Moloka‘i. Seven translocated populations are provided protection by fencing and nonnative plant control. Rodent control is conducted at one translocated population and slug control is conducted at one translocated population. Seed collections, propagation, and augmentation and translocation are ongoing, with approximately 230 of the 350 recently reintroduced individuals surviving. In addition, cross-pollination is conducted for production of more viable fruit. All known wild plants are represented in seed storage, propagation, and translocations.

Stabilizing (interim), downlisting, and delisting objectives are provided in the Recovery Plan for the Multi-Island Plants (USFWS 1999) 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 grimesiana* ssp. *grimesiana* 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 an *ex situ* (secured off-site, such as a nursery or seed bank) collection that is well managed. In addition, a minimum of three populations should be documented on O‘ahu and Moloka‘i where they now occur or occurred historically. Each of these populations must be naturally reproducing (i.e., viable seeds, seedlings) and increasing in number, with a minimum of 50 mature, reproducing individuals per population.

The preventing extinction goals for *Cyanea grimesiana* ssp. *grimesiana* have not been met. Genetic storage is complete and cross-pollination is conducted in an attempt to produce more viable seeds and plants (Table 1); however, no natural recruitment is reported at the translocated populations (Table 1). Predation by rodents and invertebrates is addressed at only one translocated population. The threat of destruction by landslides has not been addressed (Table 1, Table 2). Therefore, *Cyanea grimesiana* ssp. *grimesiana* 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 surveys for populations of *Cyanea grimesiana* ssp. *grimesiana* in historical locations and in areas of potentially suitable habitat.
- Ungulate monitoring and control—Continue to maintain fenced exclosures to protect individuals from the negative impacts of habitat destruction and browsing by feral ungulates.
- Invasive nonnative plant monitoring and control—Continue control of established ecosystem-altering nonnative invasive plant species, and those that compete with *C. grimesiana* ssp. *grimesiana*.
- Climate change adaptation strategy—Assess the modeled effect of climate change on this subspecies and use to determine future landscape needed for its recovery.
- Predator and herbivore monitoring and control—
  - Implement effective methods to control predation by rodents at all populations.

- Determine effective methods to control invertebrates (slugs) and implement at all populations
- Captive propagation for genetic storage and reintroduction—
  - Continue collection and propagation efforts for maintenance of genetic stock and for translocation.
  - Continue experimental cross-pollination to produce more viable fruit.
- Build resiliency, redundancy, and representation—
  - Increase the species' viability through habitat restoration and threat control.
  - Continue to translocate individuals into suitable habitat that is being managed for known threats to this subspecies to reduce impacts of predation and landslides.
- Alliance and partnership development—Continue to work with the Division of Forestry and Wildlife, partners, and other land managers in planning and implementation of ecosystem-level restoration and management to benefit this species.

**References:**

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

\_\_\_\_\_ Date \_\_\_\_\_