

5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Cyanea mceldowneyi* (haha)

Current Classification: Endangered

Federal Register Notice announcing initiation of this review:

[USFWS] U.S. Fish and Wildlife Service. 2012. Endangered and threatened wildlife and plants; 5-year status reviews of 46 species in Idaho, Oregon, Washington, Nevada, Montana, Hawaii, Guam, and the Northern Mariana Islands. Federal Register 77(44):13248-13251.

Lead Region/Field Office:

Region 1/Pacific Islands Fish and Wildlife Office (PIFWO), Honolulu, Hawaii

Name of Reviewer(s):

Chelsie Javar-Salas, Plant Biologist, PIFWO
Maui Nui and Hawaii Island Team Manager, PIFWO
Marie Bruegmann, Plant Recovery Coordinator, PIFWO
Recovery Program Lead, PIFWO
Kristi Young, Programmatic Deputy Field Supervisor, PIFWO

Methodology used to complete this 5-year review:

This review was conducted by staff of the Pacific Islands Fish and Wildlife Office of the U.S. Fish and Wildlife Service (USFWS), beginning on March 6, 2012. The review was based on a review of current, available information since the last 5-year review for *Cyanea mceldowneyi* (USFWS 2008). The evaluation of Chelsie Javar-Salas, Plant Biologist, was reviewed by the Island Team Manager, and Plant Recovery Coordinator, followed by the Recovery Program Lead. It was subsequently reviewed and approved by the Programmatic Deputy Field Supervisor

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/tess_public).

Review Analysis:

Please refer to the previous 5-year review for *Cyanea mceldowneyi* published on January 18, 2008 (available at http://ecos.fws.gov/docs/five_year_review/doc1772.pdf) for a complete review of the species' status, threats, and management efforts. No significant new information regarding the species' biological status has come to light since listing to warrant a change in the Federal listing status of *C. mceldowneyi*.

This short-lived perennial shrub is endangered and is endemic to the island of Maui. The current status and trends for *Cyanea mceldowneyi* are provided in the tables below.

New status information:

In addition to those populations cited in the previous 5-year review, new observations include the following:

- The Plant Extinction Prevention Program (PEPP) (2009) reported discovering nine wild individuals of *C. mceldowneyi* on East Maui during a survey.
- Five wild individuals of *C. mceldowneyi* were discovered by PEPP (2010) while conducting rare plant surveys.
- In 2011, there were seven mature wild individuals, two immature individuals, and two seedlings of *C. mceldowneyi* on Maui (PEPP 2011).
- The proposed listing and critical habitat rule identified 11 locations, containing more than 100 wild individuals, in the lowland wet, montane wet, and montane mesic ecosystems on Maui (USFWS 2012).

Overall, the numbers of individuals have increased from approximately 60 wild individuals reported in the previous 5-year review to more than 100 wild individuals (USFWS 2012).

New threats:

- Climate change degradation of habitat – Climate change may pose a threat to this species. Fortini *et al.* (2013) conducted a landscape-based assessment of climate change vulnerability for native plants of Hawaii using high resolution climate change projections. Climate change vulnerability is defined as the relative inability of a species to display the possible responses necessary for persistence under climate change. The assessment by Fortini *et al.* (2013) concluded that *C. mceldowneyi* is moderately vulnerable to the impacts of climate change. Therefore, additional management actions are needed to conserve this taxon into the future.
- Slug herbivory – Herbivory by slugs has been reported as a new threat to this species (PEPP 2009).
- Rodent predation or herbivory – Predation or herbivory by rats have been reported as a threat to this species (PEPP 2009).
- Invasive introduced plants – Newly observed invasive introduced plants that are a threat to *C. mceldowneyi* include *Hedychium coronarium* (white ginger), *Spathiphyllum cannifolium* (spathe flower), and *Psidium cattleianum* (strawberry guava) (PEPP 2013).
- Landslides and flooding – Flooding is a threat to this species (PEPP 2013).

New management actions:

- Captive propagation for genetic storage and reintroduction
 - The Harold L. Lyon Arboretum Seed Conservation Laboratory (2013a) contains more than 9,000 seeds of *C. mceldowneyi* in storage.
 - The Harold L. Lyon Arboretum Micropropagation Laboratory (2013b) has more than 74 propagules in captive propagation.
 - Olinda Rare Plant Facility (2013) has four plants at their nursery.
- Surveys / inventories – Surveys conducted by PEPP for various species of *Cyanea* in East Maui lead to the discovery of new individuals of *C. mceldowneyi* (PEPP 2009, 2010, 2011, 2013).

- Listing and critical habitat designation – Seven units of occupied and unoccupied areas of critical habitat for *C. mceldowneyi* were proposed in the lowland wet, montane wet, and montane mesic ecosystems on Maui (USFWS 2012). The final rule for critical habitat designations has not been published at the time of this review.

Synthesis:

Stabilizing, downlisting, and delisting objectives are provided in the recovery plan for the Maui plant cluster (USFWS 1997), based on whether the species is an annual, a short-lived perennial (fewer than 10 years), or a long-lived perennial. *Cyanea mceldowneyi* is a short-lived perennial, and to be considered stable, this species must be managed to control threats (e.g. fenced) and be represented in an *ex situ* (at other than the plant's natural location, such as a nursery or arboretum) collection. In addition, a minimum of three populations should be documented on Maui. Each of these populations must be naturally reproducing and increasing in number, with a minimum of 50 mature individuals per population.

The interim stabilization goals for this species have not been met, as no population of 25 or more mature individuals exists (Table 1) and all threats are not being sufficiently managed throughout all of the populations (Table 2). Therefore, *Cyanea mceldowneyi* meets the definition of endangered, as it remains in danger of extinction throughout its range.

Recommendations for future actions:

- Surveys / inventories – Continue surveying geographical and historical range for a current assessment of the species' status.
- Captive propagation genetic storage and reintroduction
 - Continue collection of genetic resources for storage, propagation, and reintroduction into protected suitable habitat within historical range.
 - Evaluate genetic resources currently in storage to determine the need to place additional genetic resources in long-term storage due to this species' vulnerability to climate change.
- Ungulate monitoring and control – Fence remaining populations to protect them from the impacts of feral ungulates.
- Invasive plant monitoring and control – Control invasive introduced plant species within the vicinity of all known individuals especially focusing on *Clidemia hirta* (Koster's curse), *Tibouchina herbacea* (glorybush), and *Hedygium gardnerianum* (kahili ginger) (PEPP 2013).
- Predator / herbivore monitoring and control – Control slugs and rodents within the vicinity of all known *C. mceldowneyi* populations.
- Population viability monitoring and analysis – Monitor wild populations on East Maui.
- Climate change adaptation strategy – Research the suitability of habitat for reintroducing this species in the future due to the impacts of climate change.
- Alliance and partnership development – Initiate planning and contribute to implementation of ecosystem-level restoration and management to benefit this taxon.

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

Date	No. wild individuals	No. outplanted	Stabilization Criteria identified in Recovery Plan	Stabilization Criteria Completed?
1992 (listing)	< 30	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 25 mature individuals each	No
1996 (recovery plan)	> 144	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 25 mature individuals each	No
2003 (critical habitat)	36	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 25 mature individuals each	No
2008 (5-yr review)	~ 60	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 25 mature individuals each	No
2012 (critical habitat – proposed)	> 100	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 25 mature individuals each	No
2014 (5-yr review)	> 100	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 25 mature individuals each	No

Table 2. Threats to *Cyanea mceldowneyi* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Ungulates – degradation of habitat and herbivory	A, C, D, E	Ongoing	None
Invasive introduced plants	A, E	Ongoing	None
Landslides and flooding	A	Ongoing	None
Rodent predation or herbivory – rats	C	Ongoing	None
Slug herbivory	C	Ongoing	None
Loss of mutualists	E	Ongoing	None
Climate change	A, E	Increasing	None

References:

See previous 5-year review for a full list of references (USFWS 2008). Only references for new information are provided below.

Fortini, L., J. Price, J. Jacobi, A. Vorsino, J. Burgett, K. Brinck, F. Amidon, S. Miller, S. Gon II, G. Koob, and E. Paxton. 2013. A landscape-based assessment of climate change vulnerability for all native Hawaiian plants. Technical report HCSU-044. Hawaii Cooperative Studies Unit, University of Hawaii at Hilo, Hawaii. 141 pages.

Harold L. Lyon Arboretum Micropropagation Laboratory. 2013a. Micropropagation database. University of Hawaii at Manoa, Honolulu, Hawaii. Unpublished.

Harold L. Lyon Arboretum Seed Conservation Laboratory. 2013b. Seed storage database. University of Hawaii at Manoa, Honolulu, Hawaii. Unpublished.

Olinda Rare Plant Facility. 2013. Report on controlled propagation of listed and candidate species, as designated under the U.S. Endangered Species Act. 5 pages. Unpublished.

[PEPP] Plant Extinction Prevention Program. 2009. Annual report for Plant Extinction Prevention Program, fiscal year 2009 (July 1, 2008-June 30, 2009). 115 pages. Unpublished.

[PEPP] Plant Extinction Prevention Program. 2010. Plant Extinction Prevention Program annual report, fiscal year 2010 (July 1, 2009-June 30, 2010). 122 pages. Unpublished.

[PEPP] Plant Extinction Prevention Program. 2011. Plant Extinction Prevention Program annual report, fiscal year 2011 (July 1, 2010-June 30, 2011). 200 pages. Unpublished.

[PEPP] Plant Extinction Prevention Program. 2013. Plant Extinction Prevention Program annual report, fiscal year 2013 (July 1, 2012-June 30, 2013). 207 pages. Unpublished.

[USFWS] U.S. Fish and Wildlife Service. 1997. Recovery plan for the Maui plant cluster. U.S. Fish and Wildlife Service, Portland, Oregon. 130 pages + appendices.

[USFWS] U.S. Fish and Wildlife Service. 2008. *Cyanea mceldowneyi* 5-year review short form summary. U.S. Fish and Wildlife Service, Honolulu, Hawaii. 6 pages.

[USFWS] U.S. Fish and Wildlife Service. 2012. Endangered and threatened wildlife and plants; listing 38 species on Molokai, Lanai, and Maui as endangered and designating critical habitat on Molokai, Lanai, Maui, and Kahoolawe for 135 species; proposed rule. Federal Register 77(112):34464-34775.

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

Pre-1992 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

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