

5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Cyanea lobata* (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, 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 lobata* (USFWS 2011). The evaluation by Chelsie Javar-Salas, Plant Biologist, was reviewed by the Island Team Manager, 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 lobata* published on August 31, 2011 (available at http://ecos.fws.gov/docs/five_year_review/doc3821.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. lobata*.

This short-lived perennial is endangered and has two recognized subspecies: *Cyanea lobata* subsp. *lobata*, endemic to the island of Maui, and *C. lobata* subsp. *baldwinii*, endemic to the island of Lanai (USFWS 2011). The current status and trends for *C. lobata* are provided in the tables below.

New status information:

In 2013, the single population of *C. lobata* subsp. *baldwinii* on Lanai contained two mature wild individuals (Plant Extinction Prevention Program [PEPP] 2013). There are two populations of *C. lobata* subsp. *lobata* on Maui containing three wild mature individuals (PEPP 2013). The number of individuals has decreased from the three individuals reported for *C. lobata* subsp. *baldwinii* and four individuals reported for *C. lobata* subsp. *lobata* in the previous 5-year review (USFWS 2011).

New threats:

- Climate Change – 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 *Cyanea lobata* is moderately vulnerable to the impacts of climate change. Therefore, additional management actions are needed to conserve this taxon into the future.
- Stochastic events – Drought mortality and reduced viability – In 2010, drought was reported as a threat to *C. lobata* subsp. *balwinii* (PEPP 2011, 2012).
- Incipient invasive plant species – *Erigeron karvinskianus* (daisy fleabane) was discovered at the Lanai population containing *C. lobata* subsp. *balwinii* (PEPP 2013). This invasive species has not been previously reported from the island of Lanai (PEPP 2013).

New management actions:

- Captive propagation for genetic storage and reintroduction
 - In 2010, two basal sprouts from the two individuals of *C. lobata* subsp. *baldwinii* were collected on Lanai for propagation at the rare plant nursery and/or storage at the micropropagation laboratory (PEPP 2010). The basal sprouts were collected after being damaged by rats (*Rattus* spp.) in 2009 (PEPP 2010).
 - Seeds were collected from two individuals of *C. lobata* subsp. *baldwinii* growing at the Olinda Rare Plant Facility and sent to Lyon Arboretum for storage (PEPP 2012).
 - In 2009, seeds of *C. lobata* subsp. *lobata* collected from two individuals at Kapunakea Preserve were given to Olinda Rare Plant Facility for propagation (PEPP 2010).
 - Seeds were collected from individuals of *C. lobata* subsp. *lobata* growing at the Olinda Rare Plant Nursery and sent to Lyon Arboretum for storage (PEPP 2012).
 - In 2011, seeds of *C. lobata* subsp. *lobata* were collected from Kapunakea Preserve and sent to Olinda and Lyon Arboretum for genetic storage and propagation (PEPP 2012).
 - There are more than 51,000 seeds of *C. lobata* subsp. *baldwinii* and more than 16,000 seeds of *C. lobata* subsp. *lobata* in storage at the Harold L. Lyon Arboretum Seed Conservation Laboratory (2013).

- Olinda Rare Plant Facility (2013) has 15 individuals of *C. lobata* subsp. *baldwinii* and 24 individuals of *C. lobata* subsp. *lobata* in propagation at its nursery.
- Ungulate monitoring and control – A plastic fence was constructed in March 2008 by staff of the Maui Natural Area Reserve System (NAR) at the West Maui NAR (PEPP 2012).
- Invasive plant monitoring and control
 - Weeds were controlled by the Plant Extinction Prevention Program on Lanai for *C. lobata* subsp. *baldwinii* (PEPP 2010, 2011, 2012, 2013).
 - Weeds were controlled at the Nature Conservancy’s Kapunakea Preserve on Maui for *C. lobata* subsp. *lobata* (PEPP 2010).
 - Weeds were controlled around the new outplanting site for *C. lobata* subsp. *lobata* at Waikapu Valley (PEPP 2012).
 - At Puu Kukui Preserve, weeds were manually controlled by the Plant Extinction Prevention Program (2013).
- Surveys / inventories
 - In 2009, a survey for *C. lobata* subsp. *lobata* at a formerly occupied site and surrounding area at Waikapu Valley on Maui was conducted by the Plant Extinction Prevention Program (2010); no plants were found.
 - In 2010, the Plant Extinction Prevention Program (2010) surveyed the Puu Kukui Preserve on Maui for *C. lobata* subsp. *lobata*; no individuals were observed.
- Predator / herbivore control – Rat traps were used to control rats at the Lanai population (PEPP 2012).
- Reintroduction / translocation
 - Eight individuals of *C. lobata* subsp. *lobata* were outplanted at two sites within Waikapu Valley by the Plant Extinction Prevention Program (2012).
 - Four individuals of *C. lobata* subsp. *lobata* were outplanted within a fenced enclosure at West Maui Natural Area Reserve in 2008 and 2011 for a total of eight individuals (PEPP 2012).
- Population viability monitoring and analysis
 - The Plant Extinction Prevention Program (2010, 2011, 2012, 2013) monitored the population of *C. lobata* subsp. *baldwinii* on Lanai.
 - The population of *C. lobata* subsp. *lobata* at the Nature Conservancy’s Kapunakea Preserve on Maui was monitored for seed by the Plant Extinction Prevention Program (2012).
 - The Plant Extinction Prevention Program (2013) monitored the population of *C. lobata* subsp. *lobata* at Puu Kukui Preserve.
- Listing and critical habitat designation – Eleven units of unoccupied and occupied areas of critical habitat for *C. lobata* was proposed in the lowland wet and wet cliff ecosystems on Maui and a single unit of occupied and unoccupied areas in the montane wet ecosystem on Lanai (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 Maui plant cluster recovery plan (USFWS 1997), based on whether the species is an annual, a short-lived perennial (fewer than 10 years), or a long-lived perennial. *Cyanea lobata* 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 islands where it now occurs or occurred historically. Each of these populations must be naturally reproducing and increasing in number, with a minimum of 50 mature individuals per population.

The stabilization goals for this species have not been met, as no population has more than 50 mature individuals (Table 1) and all threats are not being sufficiently managed throughout all of the populations (Table 2). Therefore, *Cyanea lobata* meets the definition of endangered, as it remains in danger of extinction throughout its range.

Recommendations for future actions:

- Surveys / inventories – Survey 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 – Eradicate invasive introduced plant species within ungulate exclosures and maintain the exclosures free of invasive introduced plants.
- Predator / herbivore monitoring and control – Control slugs and rodents within the vicinity of all known *C. lobata* populations.
- Population viability monitoring and analysis – Continue monitoring wild and outplanted individuals.
- 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 lobata* from listing through current 5-year review.

Date	No. wild indivs	No. outplanted	Stabilization Criteria identified in Recovery Plan	Stabilization Criteria Completed ?
1992 (listing)	Unknown	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
1997 (recovery plan)	Unknown	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2003 (critical habitat)	15	0	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2011 (5-yr review)	<i>C. lobata</i> subsp. <i>baldwinii</i> 3; <i>C. lobata</i> subsp. <i>lobata</i> 4	4	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2012 (critical habitat – proposed)	<i>C. lobata</i> subsp. <i>baldwinii</i> 3-4; <i>C. lobata</i> subsp. <i>lobata</i> 8	Unknown	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2014 (5-yr review)	<i>C. lobata</i> subsp. <i>baldwinii</i> 2; <i>C. lobata</i> subsp. <i>lobata</i> 3	8	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No

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

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Ungulates – degradation of habitat and herbivory	A, C, D, E	Ongoing	Partially
Invasive introduced plants	A, E	Ongoing	Partially, weeds controlled on Lanai
Incipient invasive weeds	A	Ongoing	Partially, controlled on Lanai
Rodent predation or herbivory – rats	C	Ongoing	None
Slugs herbivory	C	Ongoing	None
Drought	E	Ongoing	None
Landslides and erosion	E	Ongoing	None
Low numbers	E	Ongoing	Partially, seed collection and reintroduction
Climate change	A, E	Increasing	None

References:

See previous 5-year review for a full list of references (USFWS 2011). 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 Seed Conservation Laboratory. 2013. 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. 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. 2012. Plant Extinction Prevention Program annual report, fiscal year 2012 (July 1, 2011-June 30, 2012). 169 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. 2011. *Cyanea lobata* 5-year review summary and evaluation. U.S. Fish and Wildlife Service, Honolulu, Hawaii. 18 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 lobata* (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 **Programmatic Deputy Field Supervisor, Pacific Islands Fish and Wildlife Office**

Maria M. Bluegmann

Date 2014-03-12