

## 5-YEAR REVIEW

Short Form Summary

**Species Reviewed:** *Cyanea hamatiflora* ssp. *hamatiflora* (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):**

Rachel Rounds, Fish and Wildlife 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 hamatiflora* ssp. *hamatiflora* (USFWS 2009). The evaluation by Rachel Rounds, Fish and Wildlife Biologist, was reviewed by the Island Team Manager and the 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](http://ecos.fws.gov/tess_public)).

### **Review Analysis:**

Please refer to the previous 5-year review for *Cyanea hamatiflora* ssp. *hamatiflora* published on July 21, 2009 (available at [http://ecos.fws.gov/docs/five\\_year\\_review/doc2461.pdf](http://ecos.fws.gov/docs/five_year_review/doc2461.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 *Cyanea hamatiflora* ssp. *hamatiflora*.

This short-lived perennial is endangered and occurs on the island of Maui on the slopes of Haleakala (USFWS 2002). The current status and trends for *Cyanea hamatiflora* ssp. *hamatiflora* are provided below.

#### New status information:

There are currently between 458 and 558 individuals in the wild, including both mature and immature individuals (Maui Nui Task Force 2010; USFWS 2012). The populations include 400 to 500 individuals at Kipahulu, 55 at Koolau Forest Reserve, and a single individual at lower Hanawi. The number of individuals has slightly increased from an estimated range of 382 to 482 individuals reported in the previous 5-year review to 458 to 558 individuals for the current 5-year review.

#### New threats:

- Climate change destruction or 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 *Cyanea hamatiflora* ssp. *hamatiflora* is moderately vulnerable to the impacts of climate change. Therefore, additional management actions are needed to conserve this taxon into the future.

#### New management actions:

- Population viability monitoring and analysis
  - In 2011, Haleakala National Park monitored four sites containing a total of 38 individuals of *C. hamatiflora* ssp. *hamatiflora* (Haleakala National Park 2011).
- Captive propagation for genetic storage and reintroduction
  - The Harold L. Lyon Arboretum's Seed Conservation Lab (2013) has 917 seeds in storage.
  - There are nine propagules of *C. hamatiflora* ssp. *hamatiflora* at the Harold L. Lyon Arboretum Micropropagation Laboratory (2013).
  - The National Tropical Botanical Garden (2013) has 20 seeds in storage.
  - Haleakala National Park (2011) collected three fruits in 2012 from a single individual for storage at their seed storage facility.
- Listing and critical habitat designation – Four occupied and three unoccupied units of critical habitat for *Cyanea hamatiflora* ssp. *hamatiflora* was 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 multi-island plants (USFWS 2002), based on whether the species is an annual, a short-lived perennial (fewer than 10 years), or a long-lived perennial. *Cyanea hamatiflora* ssp. *hamatiflora* is a short-lived perennial, and to be considered stable, the taxon 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 the island of 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 (Table 1), as only a single population contains more than 50 mature individuals, and all threats are not being sufficiently managed throughout all of the populations (Table 2). Therefore, *Cyanea hamatiflora* ssp. *hamatiflora* meets the definition of endangered as it remains in danger of extinction throughout its range.

**Recommendations for Future Actions:**

- Captive propagation for genetic storage and reintroduction
  - 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.
  - Continue seed collection for *ex situ* genetic storage and reintroduction.
- Reintroduction / translocation – Augment populations as genetically appropriate individuals become available in nurseries and as habitat is protected.
- Surveys / inventories – Survey the geographical and historical range for a current assessment of the species' status.
- 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 *C. hamatiflora* ssp. *hamatiflora* populations.
- Predator / herbivore monitoring and control – Control rodents and slugs within the vicinity of all known *C. hamatiflora* ssp. *hamatiflora* populations.
- Threats – predator / herbivore control research – Determine what invertebrates are damaging *C. hamatiflora* ssp. *hamatiflora* fruits.
- 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 hamatiflora* ssp. *hamatiflora* from listing through current 5-year review.**

<b>Date</b>	<b>No. wild indivs</b>	<b>No. outplanted</b>	<b>Stabilization Criteria identified in Recovery Plan</b>	<b>Stabilization Criteria Completed?</b>
1999 (listing)	70-125	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2002 (recovery plan)	12	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2003 (critical habitat)	12	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2008 (5-yr review)	382-482	15	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2012 (critical habitat - proposed)	458-558	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)	458-558	0	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 hamatiflora* ssp. *hamatiflora* and ongoing conservation efforts.**

<b>Threat</b>	<b>Listing factor</b>	<b>Current Status</b>	<b>Conservation/ Management Efforts</b>
Ungulates – degradation of habitat and herbivory	A, C, D, E	Ongoing	Partially, some populations/individuals are within fenced units
Invasive introduced plants	A, E	Ongoing	None
Rodent predation or herbivory – rats	C	Ongoing	None
Slugs herbivory	C	Ongoing	None
Invertebrate predation and herbivory – unknown species	C	Ongoing	None
Landslides and erosion	E	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 2009). 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.

Haleakala National Park. 2011. Annual report for threatened and endangered species, permit TE-014497-11. 5 pages. Unpublished.

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

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

Maui Nui Task Force. 2010. Maui nui task force meeting notes, September 10, 2010. 11 pages. Unpublished.

National Tropical Botanical Garden. 2013. Report on controlled propagation of listed and candidate species, as designated under the U.S. Endangered Species Act. 30 pages. Unpublished.

- [USFWS] U.S. Fish and Wildlife Service. 2002. Addendum to the recovery plan for the multi-island plants. U.S. Fish and Wildlife Service, Portland, Oregon. 125+ pages.
- [USFWS] U.S. Fish and Wildlife Service. 2009. *Cyanea hamatiflora* ssp. *hamatiflora* 5-year review summary and evaluation. U.S. Fish and Wildlife Service, Honolulu, Hawaii. 13 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 hamatiflora ssp. hamatiflora***  
**(haha)**

**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
- No Change in listing status

**Appropriate Listing/Reclassification Priority Number, if applicable:** \_\_\_\_\_

*for* **Programmatic Deputy Field Supervisor, Pacific Islands Fish and Wildlife Office**

Maui M. Bugmann

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