

Cyanea hamatiflora ssp. *hamatiflora*
(Haha)

**5-Year Review
Summary and Evaluation**

**U.S. Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
Honolulu, Hawaii**

5-YEAR REVIEW

Species reviewed: *Cyanea hamatiflora* ssp. *hamatiflora* (Haha)

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5-YEAR REVIEW
***Cyanea hamatiflora* ssp. *hamatiflora*/ Haha**

1.0 GENERAL INFORMATION

1.1 Reviewers

Lead Regional Office:

Region 1, Endangered Species Program, Division of Recovery, Jesse D`Elia,
(503) 231-2071

Lead Field Office:

Pacific Islands Fish and Wildlife Office, Gina Shultz, Deputy Field Supervisor,
(808) 792-9400

Cooperating Field Office(s):

N/A

Cooperating Regional Office(s):

N/A

1.2 Methodology used to complete the review:

This review was conducted by staff of the Pacific Islands Fish and Wildlife Office (PIFWO) of the U.S. Fish and Wildlife Service (USFWS) in 2008. The Bernice P. Bishop Museum provided most of the updated information on the current status of *Cyanea hamatiflora* ssp. *hamatiflora* along with recommendations for conservation actions that may be needed prior to the next five-year review. The evaluation of the status of the species was prepared by the lead PIFWO biologist and reviewed by the Plant Recovery Coordinator. The document was then reviewed by the Recovery Program Leader and acting Assistant Field Supervisor for Endangered Species, and Deputy Field Supervisor, before submission to the Field Supervisor for approval.

1.3 Background:

1.3.1 Federal Register (FR) Notice citation announcing initiation of this review:

USFWS. 2007. Endangered and threatened wildlife and plants; initiation of 5-year reviews of 71 species in Oregon, Hawaii, Commonwealth of the Northern Mariana Islands, and Territory of Guam. Federal Register 72(45):10547-10550

1.3.2 Listing history

Original Listing

FR notice: USFWS. 1999. Endangered and threatened wildlife and plants; final endangered status for 10 plant taxa from Maui Nui, HI. Federal Register 64(171):48307-48324.

Date listed: September 3, 1999

Entity listed: Subspecies

Classification: Endangered

Revised Listing, if applicable

FR notice: N/A

Date listed: N/A

Entity listed: N/A

Classification: N/A

1.3.3 Associated rulemakings:

USFWS. 2003. Endangered and threatened wildlife and plants; designation of critical habitat for 60 plant species from the islands of Maui and Kahoolawe, HI. Federal Register 68(93):25934-26165.

Critical habitat was designated for *Cyanea hamatiflora* ssp. *hamatiflora* in two units totaling 1,921 hectares (4,744 acres) on Maui. This designation includes habitat on State, Federal and private lands (USFWS 2003).

1.3.4 Review History:

Species status review [FY 2007 Recovery Data Call (September 2007)]:
Stable

Recovery achieved:

1 (0-25%) (FY 2007 Recovery Data Call)

1.3.5 Species' Recovery Priority Number at start of this 5-year review:

6

1.3.6 Current Recovery Plan or Outline

Name of plan or outline: USFWS. 2002. Addendum to the Recovery Plan for the Multi-Island Plants. U.S. Fish and Wildlife Service, Portland, OR. viii + 125 pages.

Date issued: September, 19, 2002.

Dates of previous revisions, if applicable: N/A

2.0 REVIEW ANALYSIS

2.1 Application of the 1996 Distinct Population Segment (DPS) policy

2.1.1 Is the species under review a vertebrate?

Yes
 No

2.1.2 Is the species under review listed as a DPS?

Yes
 No

2.1.3 Was the DPS listed prior to 1996?

Yes
 No

2.1.3.1 Prior to this 5-year review, was the DPS classification reviewed to ensure it meets the 1996 policy standards?

Yes
 No

2.1.3.2 Does the DPS listing meet the discreteness and significance elements of the 1996 DPS policy?

Yes
 No

2.1.4 Is there relevant new information for this species regarding the application of the DPS policy?

Yes
 No

2.2 Recovery Criteria

2.2.1 Does the species have a final, approved recovery plan containing objective, measurable criteria?

Yes
 No

2.2.2 Adequacy of recovery criteria.

2.2.2.1 Do the recovery criteria reflect the best available and most up-to date information on the biology of the species and its habitat?

Yes
 No

2.2.2.2 Are all of the 5 listing factors that are relevant to the species addressed in the recovery criteria?

Yes
 No

2.2.3 List the recovery criteria as they appear in the recovery plan, and discuss how each criterion has or has not been met, citing information:

A synthesis of the threats (Factors A, C, D, and E) affecting this species is presented in section 2.4. Factor B (overutilization for commercial, recreational, scientific, or educational purposes) is not known to be a threat to this species.

Stabilizing, downlisting, and delisting objectives are provided in the addendum to the recovery plan for the 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, weeding, etc.) and be represented in an *ex situ* (off-site) 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.

This recovery objective has not been met.

For downlisting, a total of five to seven populations of *Cyanea hamatiflora* ssp. *hamatiflora* should be documented on Maui. Each of these populations must be naturally reproducing, stable or increasing in number, and secure from threats, with a minimum of 300 mature individuals per population. Each population should persist at this level for a minimum of five consecutive years before downlisting is considered.

This recovery objective has not been met.

For delisting, a total of eight to ten populations of *Cyanea hamatiflora* ssp. *hamatiflora* should be documented on Maui. Each of these populations must be naturally reproducing, stable or increasing in number, and secure from threats, with 300 mature individuals per population for short-lived perennials. Each population should persist at this level for a minimum of five consecutive years before delisting is considered.

This recovery objective has not been met.

2.3 Updated Information and Current Species Status

In addition to the status summary table below, information on the species' status and threats was included in the final critical habitat rule referenced above in section 1.3.3 ("Associated Rulemakings") and in section 2.4 ("Synthesis") below, which also includes any new information about the status and threats of the species.

Table 1. Status of *Cyanea hamatiflora* ssp. *hamatiflora* (Haha) from listing through 5-year review.

Date	No. wild individuals	No. outplanted	Stability Criteria identified in Recovery Plan	Stability Criteria Completed?
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-year review)	382-482	15	All threats managed	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	Partially

2.3.1 Biology and Habitat [see note in section 2.3]

2.3.1.1 New information on the species' biology and life history:

2.3.1.2 Abundance, population trends (e.g. increasing, decreasing, stable), demographic features (e.g., age structure, sex ratio, family size, birth rate, age at mortality, mortality rate, etc.), or demographic trends:

2.3.1.3 Genetics, genetic variation, or trends in genetic variation (e.g., loss of genetic variation, genetic drift, inbreeding, etc.):

2.3.1.4 Taxonomic classification or changes in nomenclature:

2.3.1.5 Spatial distribution, trends in spatial distribution (e.g. increasingly fragmented, increased numbers of corridors, etc.), or historic range (e.g. corrections to the historical range, change in distribution of the species' within its historic range, etc.):

2.3.1.6 Habitat or ecosystem conditions (e.g., amount, distribution, and suitability of the habitat or ecosystem):

2.3.1.7 Other:

2.3.2 Five-Factor Analysis (threats, conservation measures, and regulatory mechanisms) [see note in section 2.3]

2.3.2.1 Present or threatened destruction, modification or curtailment of its habitat or range:

2.3.2.2 Overutilization for commercial, recreational, scientific, or educational purposes:

2.3.2.3 Disease or predation:

2.3.2.4 Inadequacy of existing regulatory mechanisms:

2.3.2.4 Other natural or manmade factors affecting its continued existence:

2.4 Synthesis

Historically, *Cyanea hamatiflora* ssp. *hamatiflora* was known from eight locations on the northeastern side of Haleakala, Maui. In 1999, this taxon was known from two locations. Five to six populations totaling 50 to 100 individuals in Kipahulu Valley occurred within Haleakala National Park and five or six populations totaling 20 to 25 widely scattered individuals occurred

in the Waikamoi-Koolau Gap area on privately owned land (USFWS 1999). By 2002, the species had declined to seven populations consisting of a total of 12 individuals within the East Maui Watershed Partnership in Honomanu, Wailuaiki, Kipahulu Valley, Koukouai, and Puu Ahulili on State (Koolau and Kipahulu Forest Reserves), Federal (Haleakala National Park), and privately owned lands (USFWS 2002). *Cyanea hamatiflora* ssp. *hamatiflora* favors deep gulches in *Metrosideros* (ohia) dominated wet forest 5 to 10 meters (16 to 33 feet) in height, where it grows in riparian corridors and on lower slopes, often on scree, talus, or boulder strewn substrates (H. Oppenheimer, Maui Nui Coordinator, Plant Extinction Prevention Program, pers. comm. 2008). This taxon does not seem to have a preference for leeward or windward aspects. Populations in Kipahulu Valley are relatively difficult to distinguish; however, it is speculated that approximately 300 to 400 individuals occur in all life stages (P. Welton, Botanist/Resource Manager, Haleakala National Park, pers. comm. 2008). This is the largest concentration of this taxon, as elsewhere it usually occurs as sporadic individuals or small clusters of plants. One small population of few individuals was discovered between 2002 and 2004 growing in the Kaapahu area, near Kipahulu (Welton and Haus 2008). The numbers of individuals in this small population are unknown (P. Welton, pers. comm. 2008). Additional surveys by the Maui Nui Plant Extinction Prevention Program discovered four mature adults and a single juvenile in the west fork of West Wailua Iki; 39 adults and several juveniles in the east fork of West Wailua Iki; eight adults and three juveniles in West Wailua Nui Stream; and three adults with two juveniles in the west fork of Waiokamilo Stream on State lands. On private lands, 17 adults and nine juveniles with height of 1 to 3 meters (3.2 to 9.8 feet) were found in 2007. All the individuals discovered are within the elevation gradient known for the subspecies. Total numbers are estimated between 382 and 482. Additional surveys are likely to encounter more populations (H. Oppenheimer, pers. comm. 2008). The subspecies no longer occurs as far west as the type locality of Puu O Kakae, and the known western edge of its current range is Haipuaena Stream (H. Oppenheimer, pers. comm. 2008).

Invasive introduced plant species (Factor E), and habitat degradation by feral pigs (*Sus scrofa*) (Factor A and D) remain the major threats to the habitat of the subspecies (USFWS 1999, 2002). The most serious plant species threatening *Cyanea hamatiflora* ssp. *hamatiflora* are *Clidemia hirta* (Koster's course), *Rubus argutus* (blackberry), *Prunella vulgaris* (selfheal), *Tibouchina herbacea* (herbaceous glorytree), *Miconia calvescens* (velvet tree), *Hedychium gardnerianum* (kalihi ginger) and *Ageratina adenophora* (Maui pamakani). Rats (*Rattus* spp.), slugs, and feral pigs are known to be present in its entire habitat and they are known to prey on this taxon (Factor C) (USFWS 1999, 2002, 2003; P. Welton and H. Oppenheimer, pers. comms. 2008). An unknown insect infests fruits preventing the development of seeds (Factor C) (H. Oppenheimer, pers. comm. 2008). While The Nature Conservancy of Hawaii and Haleakala National Park have management plans that address the threats to the subspecies (USFWS 2002), implementation has not been documented to date. The population found in Kaapahu is unfenced and also threatened by feral goats (*Capra hircus*) (Factors A, C, and D). Feral pig control activities conducted by the East Maui Watershed Partnership protect plants above the strategic fence. However, many plants occur below this protective barrier, and vigilance must be maintained to prevent ingress past storm-damaged sections of the fence (P. Welton, pers. comm. 2008).

Cyanea hamatiflora ssp. *hamatiflora* has been noted to be successfully reproducing, with most occurrences composed of different size classes, including juveniles as small as 60 centimeters (23.6 inches), and one adult at 8 meters (26 feet) tall. However, no newly germinated seedlings were noted, and many of the fruits are attacked on the inside by an unknown insect, with no seeds developing. Most if not all saplings were associated with reproductive-sized individuals nearby, which could be interpreted as a lack of dispersal into new areas of suitable habitat (H. Oppenheimer, pers. comm. 2008).

Landslides were identified as one of the major threats for *Cyanea hamatiflora* ssp. *hamatiflora* (Factor E). The loss of dispersal agents (Factor E) is also a threat to the long term viability of these populations (H. Oppenheimer, pers. comm. 2008).

To safeguard existing genetic material, propagation for genetic storage and reintroduction is occurring at the University of Hawaii's Lyon Arboretum Micropropagation Laboratory, Haleakala National Park and National Tropical Botanical Garden (Harold L. Lyon Arboretum Micropropagation Laboratory Database 2007; Haleakala National Park 2007; National Tropical Botanical Garden 2007). The Haleakala National Park staff reintroduced ten plants representing one individual in 2006 and five plants representing two individuals in the Kipahulu area (upper shelf) in 2007 (Haleakala National Park 2006, 2007).

The stabilization and recovery goals for this subspecies have not been met, as only one population is comprised of over 50 mature individuals and not all threats are being managed in all populations (see Table 1). Therefore, *Cyanea hamatiflora* ssp. *hamatiflora* meets the definition of endangered as it remains in danger of extinction throughout its range.

3.0 RESULTS

3.1 Recommended Classification:

Downlist to Threatened

Uplist to Endangered

Delist

Extinction

Recovery

Original data for classification in error

No change is needed

3.2 New Recovery Priority Number: N/A

Brief Rationale:

3.3 Listing and Reclassification Priority Number: N/A

Reclassification (from Threatened to Endangered) Priority Number: _____

Reclassification (from Endangered to Threatened) Priority Number: _____

Delisting (regardless of current classification) Priority Number: _____

Brief Rationale:

4.0 RECOMMENDATIONS FOR FUTURE ACTIONS

- Continue seed collection for *ex situ* genetic storage and reintroduction.
- Manage ungulates and invasive introduced plant species around remaining individuals.
- Conduct rodent control.
- Conduct research to determine method to protect from slug predation.
- Investigate a control method for insect attacking fruits.
- Augment populations as genetically appropriate individuals become available in nurseries and habitat is protected.
- Reintroduce individuals into suitable habitat within historical range that is being managed for known threats to this species.
- Continue surveys for populations in known historical sites and other areas of suitable habitat.

5.0 REFERENCES:

Harold L. Lyon Arboretum Micropropagation Laboratory. 2007. Database. Unpublished.

Haleakala National Park. 2006. Annual report for threatened and endangered species permit TE014497-10, Haleakala National Park, Resource Management, Vegetation Management. Unpublished

Haleakala National Park. 2007. Report on controlled propagation of listed and candidate species, as designated under the U.S. Endangered Species Act (June 30, 2006 – July 1, 2007). Unpublished.

National Tropical Botanical Garden. 2007. Report on controlled propagation of listed and candidate species, as designated under the U.S. Endangered Species Act. Unpublished

[USFWS] U.S. Fish and Wildlife Service. 1999. Endangered and threatened wildlife and plants; final endangered status for 10 plant taxa from Maui Nui, HA. Federal Register 64(171):48307-48324.

[USFWS] U.S. Fish and Wildlife Service. 2002. Addendum to the Recovery Plan for the Multi-Island Plants. U.S. Fish & Wildlife Service, Portland, OR. 125+ pages.

[USFWS] U.S. Fish and Wildlife Service. 2003. Endangered and threatened wildlife and plants; designation of critical habitat for 60 plant species from the islands of Maui and Kahoolawe, HI. Federal Register 68(93):25934-26165.

Welton, P. and B. Haus. 2008. Vascular Plant Inventory of Kaapahu, Haleakala National Park. Technical Report 151. Pacific Conservation Studies Unit, University of Hawaii at Manoa.

Personal communications:

Welton, Patti. 2008. Botanist/Resource Manager, Haleakala National Park. E-mail to Christian Torres, USFWS, February 20, 2008.

Oppenheimer, Hank. 2008. Maui Nui Coordinator, Plant Extinction Prevention Program. Email communication to Bernice P. Bishop Museum on Oppenheimer, Hank. Maui Nui Coordinator, Plant Extinction Prevention Program. Email communication to Bernice P. Bishop Museum.

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U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW of *Cyanea hamatiflora* ssp. *hamatiflora* (Haha)

Current Classification: E

Recommendation resulting from the 5-Year Review:

- Downlist to Threatened
- Uplist to Endangered
- Delist
- No change needed

Appropriate Listing/Reclassification Priority Number, if applicable:

Review Conducted By:

Christian Torres-Santana, Student Trainee Biologist
Marie Bruegmann, Plant Recovery Coordinator
Marilet A. Zablan, Recovery Program Leader and acting Assistant Field Supervisor for Endangered Species
Gina Shultz, Deputy Field Supervisor

Approved  Date 21 July 2009
Acting Field Supervisor, Pacific Islands Fish and Wildlife Office