

*Cyanea shipmanii*  
(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 shipmanii* (Haha)**

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# **5-YEAR REVIEW**

## ***Cyanea shipmanii*/ 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) beginning on March 8, 2007. The Bernice P. Bishop Museum provided most of the updated information on the current status of *Cyanea shipmanii* and also provided recommendations for conservation actions 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 before submission to the Field Supervisor for approval.

#### **1.3 Background:**

**1.3.1 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. 1994. Endangered and threatened wildlife and plants; determination of endangered or threatened status for 21 plants from the island of Hawaii, State of Hawaii. Federal Register 59:10305–10325.

**Date listed:** March 4, 1994

**Entity listed:** Species

**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. 2002. Endangered and Threatened Wildlife and Plants; Designations of Critical Habitat for Plant Species from the Island of Hawaii, HI; Proposed Rule. Fed. Reg. 67:36968-37016.

USFWS. 2003. Endangered and threatened wildlife and plants; final designation and nondesignation of critical habitat for 46 plant species from the island of Hawaii, HI; final rule. Fed. Reg. 67:39624–39761.

Critical habitat was designated for *Cyanea shipmanii* in three units totaling 2,444 hectares (5,998 acres) on the island of Hawaii. This designation includes habitat on State and Federal lands (USFWS 2003).

### 1.3.4 Review History:

Species status review [FY 2008 Recovery Data Call (September 2008)]:  
Stable

#### **Recovery achieved:**

1 (0-25%) (FY 2008 Recovery Data Call)

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

2

### 1.3.6 Current Recovery Plan or Outline

**Name of plan or outline:** USFWS 1996. Recovery plan for the Big Island plant cluster. U.S. Fish and Wildlife Service, Portland, OR.

**Date issued:** September 26, 1996

**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?**

*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 recovery plan for the Big Island plants (USFWS 1996), based on whether the species is a short-lived perennial (fewer than 10 years), or a long-lived perennial. *Cyanea shipmanii* 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 the Big Island. 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 been partially met.

For downlisting, a total of five to seven populations of *Cyanea shipmanii* should be documented on the Big Island. 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 shipmanii* should be documented on the Big Island. 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 proposed and final critical habitat rules 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 shipmanii* (Haha) from listing through 5-year review.**

<b>Date</b>	<b>No. wild individuals</b>	<b>No. outplanted</b>	<b>Stability Criteria identified in Recovery Plan</b>	<b>Downlisting Criteria Completed?</b>
1994 (listing)	< 50	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
1996 (recovery plan)	< 10	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2003 (critical habitat)	< 10	117	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2008 (5-year review)	4	434	All threats managed	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No

**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:**

**2.3.2.5 Other natural or manmade factors affecting its continued existence:**

## **2.4 Synthesis**

Historically, *Cyanea shipmanii* was found only on the eastern slopes of Mauna Kea, Hawaii, and at the time of Federal listing in 1994, *C. shipmanii* consisted of a single population of fewer than 50 individuals (USFWS 2003). In 2002, the taxon consisted of total of five populations with 12 individuals on State land in north Hilo, Upper Waiakea Forest Reserve; on Federal land in the Hakalau Unit of the Hakalau Forest National Wildlife Refuge (NWR); and on private land at Papaikou, south Hilo (USFWS 2002). However, by 2007 the species had declined to only two extant wild individuals in Upper Waiakea Forest Reserve and Puu Kipu unit of the Kilauea Forest Reserve (Plant Extinction Prevention Program 2007, 2008; USFWS 2008).

The seed coat of *Cyanea shipmanii* has a striate (grooved) or striate-verruculate (warty) testa, characteristic of most species within the genus *Cyanea* and all Hawaiian Lobelioideae (Buss *et al.* 2001). The species exhibits heterophylly (juvenile-adult leaf dimorphism) and thorn-like structures, which may have been a defensive adaptation against herbivory by now-extinct flightless geese (Givnish *et al.* 1994).

Feral ungulates and introduced invasive plant species remain as the major threats to the species and surrounding habitat (USFWS 2008). In particular, the remaining wild individual in the Upper Waiakea Forest Reserve is threatened from habitat destruction due to pigs (*Sus scrofa*) (Plant Extinction Prevention Program 2007). The remaining wild individual in the Upper Waiakea Forest Reserve is threatened from predation by sheep (*Ovis musimon*), and the Kilauea populations are at risk from fruit and seed predation by rats (*Rattus* spp.) (Plant Extinction Prevention Program 2007; USFWS 2008). Rat herbivory on foliage, flowers and ripe fruit has been a continuous problem in Hakalau NWR (Jeffrey and Horiuchi 2008). Trapping and rodenticide bait stations provide relief, but the remoteness of the plants does not allow for continuous monitoring and baiting of traps.

A single human-caused or natural environmental disturbance could destroy a significant percentage of the wild individuals or cause the complete loss of a population. Reduced reproductive vigor due to the small number of individuals remains as a limitation to the survival of the species.

Genetic material continues to be collected and individuals grown for the augmentation of extant populations and establishment of new populations. The Harold L. Lyon Arboretum (2008) houses 68 accessions from two sources in micropropagation and the Center for Conservation and Research Training (2008) has 12,468 seeds from four individuals in storage. The Volcano Rare Plant Facility (2008) has five individuals in genetic storage representing three wild individuals and populations, and 90 individuals in controlled propagation from two wild sources. Hakalau Forest NWR has 312 seedlings in the nursery, with 20 fruit collected from plants collected in 2006 (Jeffrey and Horiuchi 2008). Between 2006 and 2007, 384 plants cultivated in the Volcano Rare Plant Facility were outplanted in Hakalau (20 individuals), Puu Kipu (173), Upper Waiakea Forest Reserve (98), and at an unknown location on State land (25) (Jeffrey and Horiuchi 2008; Volcano Rare Plant Facility 2007). Survival of outplanted *Cyanea shipmanii* in Hakalau from 1999 to 2003 was only 37 percent (Jeffrey and Horiuchi 2008).

The stabilization and recovery goals for this species have not been met, as only two populations contain more than 50 individuals and they are not yet mature, and not all threats are being managed. Therefore, *Cyanea shipmanii* 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*  
**X** **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 to collect genetic material for augmentation of extant populations and establishment of new populations within appropriate habitat areas protected from feral ungulates and non-native plant species.
- Protection of extant populations from feral ungulates and non-native rodents.
- Continue support of the Hakalau National Wildlife Refuge and the Tri-Mountain Alliance for ecosystem-level management of suitable habitat for *Cyanea shipmanii*, as funding is available.
- Map genetic diversity in surviving *ex-situ* populations.
- Research of the life history and biology of the taxon.
- Survey for populations in appropriate ecological habitats.

**5.0 REFERENCES**

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[USFWS] U.S. Fish and Wildlife Service. 2003. Endangered and threatened wildlife and plants; final designation and nondesignation of critical habitat for 46 plant species from the island of Hawaii, HI; final rule. Federal Register 67:39624–39761.

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Volcano Rare Plant Facility. 2008. Report on controlled propagation of listed and candidate species, as designated under the U.S. endangered species act. Center for Plant Conservation Research and Training, Hilo, HI. Unpublished.

**Signature Page**  
**U.S. FISH AND WILDLIFE SERVICE**  
**5-YEAR REVIEW of *Cyanea shipmanii* (Haha)**

**Current Classification:**                   E                  

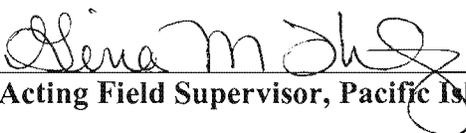
**Recommendation resulting from the 5-Year Review:**

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

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

**Review Conducted By:**

Jeff Burgett, Fish and Wildlife 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