

Cyanea procera
(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 procera* (Haha)

TABLE OF CONTENTS

1.0	GENERAL INFORMATION	1
1.1	Reviewers.....	1
1.2	Methodology used to complete the review.....	1
1.3	Background.....	1
2.0	REVIEW ANALYSIS	3
2.1	Application of the 1996 Distinct Population Segment (DPS) policy.....	3
2.2	Recovery Criteria.....	3
2.3	Updated Information and Current Species Status.....	4
2.4	Synthesis.....	6
3.0	RESULTS	7
3.1	Recommended Classification.....	7
3.2	New Recovery Priority Number.....	7
3.3	Listing and Reclassification Priority Number.....	7
4.0	RECOMMENDATIONS FOR FUTURE ACTIONS	8
5.0	REFERENCES	8
	Signature Page.....	10

5-YEAR REVIEW
***Cyanea procera* (Haha)**

1.0 GENERAL INFORMATION

1.1 Reviewers

Lead Regional Office:

Region 1, Jesse D'Elia, Chief, Division of Recovery, (503) 231-2071

Lead Field Office:

Pacific Islands Fish and Wildlife Office, Gina Shultz, Assistant Field Supervisor for Endangered Species, (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) between June 2006 and June 2007. The National Tropical Botanical Garden provided most of the updated information on the current status of *Cyanea procera*. They also provided recommendations for conservation actions that may be needed prior to the next five-year review. The evaluation of the lead PIFWO biologist was reviewed by the Plant Recovery Coordinator. These comments were incorporated into the draft five-year review. The document was then reviewed by the Recovery Program Leader and the Assistant Field Supervisor for Endangered Species before final approval.

1.3 Background:

1.3.1 FR Notice citation announcing initiation of this review:

USFWS. 2006. Endangered and threatened wildlife and plants; initiation of 5-year reviews of 70 species in Idaho, Oregon, Washington, Hawaii, and Guam. Federal Register 71(69):18345-18348.

1.3.2 Listing history

Original Listing

FR notice: USFWS. 1992. Endangered and threatened wildlife and plants; determination of endangered or threatened status for 16 plants from the island of Molokai, Hawaii; final rule. Federal Register 57(196): 46325 46340.

Date listed: October 8, 1992

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. 2003. Endangered and threatened wildlife and plants: final designation or nondesignation of critical habitat for 42 plant species from the island of Molokai, HI: final rule. Federal Register 68(52):12982-13141.

Critical habitat was designated for *Cyanea procera* in two units totaling 721 hectares (1,782 acres) on Molokai. This designation includes habitat on state, federal and private lands (USFWS 2003).

1.3.4 Review History:

Species status review [FY 2006 Recovery Data Call (September 2006)]:
Declining

Recovery achieved

1 (0-25%) (FY 2006 Recovery Data Call)

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

5

1.3.6 Current Recovery Plan or Outline

Name of plan or outline: Recovery Plan for the Molokai plant cluster. 1996. U.S. Fish and Wildlife Service, Portland, Oregon. 143 pages.

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 Molokai plant cluster (USFWS 1996). *Cyanea procera* 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* (off-site) collection. In addition, a minimum of three populations should be documented on Molokai. 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 procera* should be documented on Molokai. 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 procera* should be documented on Molokai. Each of these populations must be naturally reproducing, stable or increasing in number, and secure from threats, with 300 mature individuals per population. 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 I.C.5 ("Associated Rulemakings") and in section II.D ("Synthesis") below, which also includes any new information about the status and threats of the species.

Status of *Cyanea procera* from listing through 5-year review.

Date	No. wild inds	No. outplanted	Stability Criteria	Stability Criteria Completed?
1992 – listing	4	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
1996 – recovery plan	8	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2003 – critical habitat	10	Unknown	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2007 – 5-yr review	1	0	All threats managed	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No

2.3.1 Biology and Habitat

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)

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

Cyanea procera is a Molokai endemic species which has been identified as a priority species by the Plant Extinction Prevention Program, due to its low numbers. *Cyanea procera* has been known to grow in several places within and near what is now the Kamakou Preserve on Molokai (Hawaii Biodiversity and Mapping Program 2006). Two small populations were known on Molokai at Hanalilolilo Gulch and West Kawela Gulch. In 1992 there was one remaining plant at Hanalilolilo and three at West Kawela Gulch. As of 2005, the last plant at Hanalilolilo had died. One plant remains at West Kawela, two others having been observed dead in December 2005 (Perlman 2006).

The Hanalilolilo habitat is *Metrosideros-Dicranopteris* wet montane forest. The last plant of *C. procera* grew on a north-facing slope at 1,100 meters (3,620 feet) elevation. The West Kawela habitat is *Metrosideros-Dicranopteris* wet forest also. Here the last remaining plant grows on a small side stream, at 1,066 to 1,085 meters (3,500 to 3,560 feet) elevation. The canopy is closed, and the area is densely shaded along the stream (Perlman 2006).

Feral pig and goat activities are altering the habitat where the remaining population is located, especially in the side gulch (USFWS 1992 and 1996) (Factors A and D). Like other *Cyanea* species, *Cyanea procera* is susceptible to predation from snails, slugs, insects, and rats (Factor C). Birds have also been observed to damage the flowers (Factor C). (Perlman 2006). Invasive introduced plant species that degrade the habitat of and compete with this species include *Buddleia asiatica* (butterfly bush), *Ricinus communis* (castor bean), and *Musa* sp. (banana) (Factor E). The lack of pollinators and lack of pollen production in the flowers is also a threat (Factor E) (Perlman 2006). Species like *C. procera* that are endemic to a small portion of one island, and limited to a few populations and individuals, are inherently more vulnerable to extinction than widespread species because of the higher risks posed by genetic bottlenecks, random demographic fluctuations and localized catastrophes such as hurricanes, landslides or washouts (Factor E). For *C. procera*, stochastic events are an even greater threat because the species shows no regeneration and has only one individual remaining.

Seed was collected and sent to the Lyon Arboretum micropropagation Lab and the Center for Conservation Research and Training's seed storage lab in 2002, 2004, and 2005, but neither has not had success storing it (A. Yoshinaga, University of Hawaii Center for Conservation Research and Training, pers. comm. 2006; N. Sugii, Harold L. Lyon Arboretum, pers. comm. 2006). National Tropical Botanical Garden has no plants and no stored seed at this time (National Tropical Botanical Garden 2006).

The stabilization and recovery goals for this species have not been met, as there is only one individual remaining. Therefore, *Cyanea procera* 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:

Brief Rationale:

3.3 Listing and Reclassification Priority Number:

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:

- Collect for genetic storage.
- Spot-fence remaining individual for short-term protection from ungulates.
- Control introduced invasive plant species around remaining plant.
- Control introduced rodents, birds, insects and slugs around remaining plant, as needed.
- Augment populations as plants become available in nurseries.

5.0 REFERENCES:

Harold L. Lyon Arboretum Micropropagation Laboratory. 2006. Report on controlled propagation of species, as designated under the U.S. Endangered Species Act. Unpublished.

Hawaii Biodiversity and Mapping Program. 2006. Program Database, Unpublished.

National Tropical Botanical Garden. 2006. Report on controlled propagation of species, as designated under the U.S. Endangered Species Act. Unpublished.

Perlman, S. 2006. National Tropical Botanical Garden, summary of field logs for *Cyanea procera*, 1992-2005. Unpublished.

[USFWS] U.S. Fish and Wildlife Service. 2003. Endangered and threatened wildlife and plants: final designation or nondesignation of critical habitat for 42 plant species from the island of Molokai, HI: final rule. Federal Register 68(52):12982-13141.

[USFWS] U.S. Fish and Wildlife Service. 1996. Recovery plan for the Molokai plant cluster. U.S. Fish and Wildlife Service, Portland, Oregon. 143 pages.

[USFWS] U.S. Fish and Wildlife Service. 1992. Endangered and threatened wildlife and plants; determination of endangered or threatened status for 16 plants from the island of Molokai, Hawaii; final rule. Federal Register 57(196): 46325 46340.

Personal and Written Communications:

Nellie Sugii. Lyon Arboretum Micro-propagation Laboratory, personal communication with National Tropical Botanical Garden, 2006.

Alvin Yoshinaga. Center for Conservation Research and Training, Seed Conservation Laboratory, Harold L. Lyon Arboretum personal communication with National Tropical Botanical Garden. 2006.

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

Current Classification: _____ E _____

Recommendation resulting from the 5-Year Review:

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

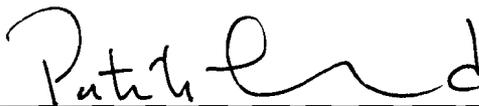
Appropriate Listing/Reclassification Priority Number, if applicable: _____

Review Conducted By:

Marilet A. Zablan, Recovery Program Leader and Acting Assistant Field Supervisor for Endangered Species, June 24, 2007

Marie Bruegmann, Plant Recovery Coordinator, May 30 and June 28, 2007

Christian Torres-Santana, Fish and Wildlife Biologist, May 11 and June 27, 2007

Approve  Date 1/18/08
Lead Field Supervisor, Fish and Wildlife Service