

5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Cyanea st.-johnii* (Haha)

Current Classification: Endangered

Federal Register Notice announcing initiation of this review:

[USFWS] U.S. Fish and Wildlife Service. 2010. Endangered and threatened wildlife and plants; initiation of 5-year status reviews of 69 species in Idaho, Washington, Hawaii, Guam, and the Commonwealth of the Northern Mariana Islands. Federal Register 75(67):17947-17950.

Lead Region/Field Office:

Region 1/Pacific Islands Fish and Wildlife Office (PIFWO), Honolulu, Hawaii

Name of Reviewer(s):

Chelsie Javar, Fish and Wildlife Biologist, PIFWO
Marie Bruegmann, Plant Recovery Coordinator, PIFWO
Jess Newton, Recovery Program Leader, PIFWO
Assistant Field Supervisor for Endangered Species, PIFWO

Methodology used to complete this 5-year review:

This review was conducted by a biological consultant for the Pacific Islands Fish and Wildlife Office of the U.S. Fish and Wildlife Service (USFWS), beginning on April 8, 2010. The review was based on a review of current, available information since the last 5-year review for *Cyanea st.-johnii* (USFWS 2007). Bernice Pauahi Bishop Museum provided an initial draft of portions of the review and recommendations for conservation actions needed prior to the next five-year review. The evaluation of Chelsie Javar, Fish and Wildlife Biologist, was reviewed by the Plant Recovery Coordinator. The document was then reviewed by the Recovery Program Leader and the Assistant Field Supervisor for Endangered Species before submission to the Field Supervisor for approval.

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 st.-johnii* published on August 2, 2007 (available at http://ecos.fws.gov/docs/five_year_review/doc1130.pdf) and the recovery plan for Oahu plants (USFWS 1998), for a complete review of the species' status, threats, and management efforts. No new threats or no significant new information regarding the species biological status have come to light since listing to warrant a change in the Federal listing status of *C. st.-johnii*.

This short-lived perennial is endangered and is endemic to the island of Oahu (USFWS 1998). The current status and trends for *Cyanea st.-johnii* are provided in the tables below.

New taxonomic information:

None reported.

New threats:

Climate change may also pose a threat to this species. However, current climate change analyses in the Pacific Islands lack sufficient spatial resolution to make predictions on impacts to this species. The Pacific Islands Climate Change Cooperative (PICCC) has currently funded climate modeling that will help resolve these spatial limitations. We anticipate high spatial resolution climate outputs by 2013.

New management actions:

- Ungulate exclosure:
 - The 71 hectare (175 acre) Helemano fence was completed in May 2007 (U.S. Army Garrison 2007).
 - In 2010, scoping to construct a fence at the Ahuimanu-Halawa Summit Ridge population unit began (U.S. Army Garrison 2010).
 - In 2010, construction began on a 3.6 hectare (8.9 acre) fence at the Waimano population unit to protect individuals of *Cyanea st.-johnii* (U.S. Army Garrison 2010).
- Ecosystem-altering invasive plant species control:
 - In Opaepa, *Setaria palmifolia* (palm grass) is treated as an incipient invasive plant species and currently has a patchy distribution (U.S. Army Garrison 2007). Large-scale control of *Setaria palmifolia* has been ongoing in the Opaepa and Helemano management unit since at least 1998. There are a few individuals of *S. palmifolia* located within 50 meters of individuals of *Cyanea st.-johnii*. Direct control of *S. palmifolia* around individuals of *C. st.-johnii* has not yet begun (Jane Beachy, Oahu Army Natural Resources Program, pers. comm. 2011).
 - In August 2009, *Schefflera actinophylla* (octopus tree) was found at the Waimano landing zone site and removed (J. Beachy, pers. comm. 2011).
- Surveys / inventories – In 2010, two additional mature and two immature individuals of *Cyanea st.-johnii* were found just north of the known individuals at Waimanalo-Wailupe Summit Ridge population unit (U.S. Army Garrison 2010).
- Captive propagation for genetic storage and reintroduction:
 - In 2010, there were less than 10 seeds for each of the 11 wild individuals represented in storage at the U.S. Army Garrison seed lab and 12 individuals in micropropagation by the U.S. Army Garrison (2010).
 - In 2010, the Center for Conservation Research and Training Seed Storage Laboratory (2010) had approximately 5,547 seeds in storage.
- Population viability monitoring:

- In 2010, staff of the Oahu Army Natural Resource Program and the Plant Extinction Prevention Program hand pollinated and collected fruits of *Cyanea st.-johnii* at the Helemano, Waimano, Ahuimanu-Halawa Summit Ridge, and Waiahole-Waiawa Summit Ridge population units (U.S. Army Garrison 2010).
- Monitoring of the Waimanalo-Wailupe Summit Ridge population units by the Plant Extinction Prevention Program showed a significant decline in the number of individuals from 11 mature individuals in 2007 to 7 mature individuals in 2009 (U.S. Army Garrison 2009).

Synthesis:

In 2010, there were 4 wild mature individuals of *Cyanea st.-johnii* at Helemano, 8 wild mature and 3 wild immature individuals at Ahuimanu-Halawa summit ridge, 6 wild mature and 3 wild immature individuals at Waiahole-Waiawa summit ridge, 10 wild mature individuals at Waihee-Waimalu summit ridge, 6 wild mature and 4 wild immature individuals at Waimanalo-Wailupe summit ridge, and 14 wild mature and 5 wild immature individuals at Waimano (U.S. Army Garrison 2010). In summary, there are 48 wild mature individuals and 16 wild immature individuals of *C. st.-johnii*.

Stabilizing, downlisting, and delisting objectives are provided in the recovery plan for plants from the island of Oahu (USFWS 1998), based on whether the species is an annual, a short-lived perennial (fewer than 10 years), or a long-lived perennial. *Cyanea st.-johnii* 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 Oahu. 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, as no population contains more than 50 mature individuals (Table 1) and all threats are only being partially managed throughout all of the known populations (Table 2). Therefore, *Cyanea st.-johnii* 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:
 - Continue to collect seeds from tagged individuals, keeping close track of the maternal source for use in *ex situ* propagation.
 - Continue to collect seeds from all existing populations and send to at least two or three different venues for propagation.
- Reintroduction / translocation implementation – Reintroduce the species back into its known historical range.
- Ungulate exclosures:

- Continue to construct fenced exclosures around existing and reintroduced populations to provide protection from feral ungulates.
- Monitor fenced exclosures for evidence of breaching by feral ungulates.
- Ungulate control – Continue to protect all populations against disturbances from feral ungulates.
- Ecosystem-altering invasive plant species control – Continue to control invasive introduced plant species around all populations.
- Predator / herbivore control – Implement effective control methods for rats.
- Surveys / inventories:
 - Continue to conduct thorough surveys of all suitable habitats where *Cyanea st-johnii* was historically seen.
 - Conduct surveys north of the Puu Pauao site to get an accurate population record of *Cyanea st-johnii*.
- Threats research:
 - Conduct studies to develop and implement control methods for slugs around all known populations.
 - Assess the modeled effects of climate change on this species, and use to determine future landscape needed for the recovery of the species.
- Population biology research – Study *Cyanea st.-johnii* populations with regard to population size and structure, geographical distribution, flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, limiting factors, and threats.
- Site / area / habitat protection – Develop and implement effective measures to reduce the impact of hiking and trail maintenance.
- Alliance and partnership development – Work with the U.S. Army, Hawaii Division of Forestry and Wildlife, and other land managers to initiate planning and contribute to implementation of ecosystem-level restoration and management to benefit this species.

Table 1. Status of *Cyanea st.-johnii* from listing through current 5-year review.

Date	No. wild indivs	No. outplanted	Stabilization Criteria identified in Recovery Plan	Downlisting Criteria Completed?
1996 (listing)	40-50	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
1998 (recovery plan)	40-50	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2003 (critical habitat)	57	0	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2007 (5-yr review)	70	0	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2012 (5-yr review)	48	0	All threats managed in all 3 populations	Partially (see Table 2)
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No

Table 2. Threats to *Cyanea st.-johnii* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Ungulates – Degradation of habitat	A, D	Ongoing	Partially: The Waimano and Helemano population units are fenced.
Established ecosystem-altering invasive plant species	A	Ongoing	Partially: <i>Setaria palmifolia</i> is controlled at Opaeula.
Rodent predation or herbivory – Rats	C	Ongoing	No
Slug herbivory	C	Ongoing	No
Established invasive plant species competition	E	Ongoing	No
Low numbers	E	Ongoing	Partially: Captive propagation for genetic storage and reintroduction, surveys / inventories, and monitoring
Hiking and trail maintenance	E	Ongoing	No
Climate change	A, E	Increasing	No

References:

See previous 5-year review for a full list of references (USFWS 2007). Only references for new information are provided below.

Center for Conservation Research and Training Seed Storage Laboratory. 2010. Seed bank inventory. Honolulu, Hawaii. Microsoft Access database. Unpublished.

U.S. Army Garrison. 2007. 2007 status report for the Makua implementation plan and the draft Oahu implementation plan. U.S. Army Garrison, Hawaii and Pacific Cooperative Park Studies Unit. Schofield Barracks, Hawaii. 611 pages. Available online at <http://manoa.hawaii.edu/hpicesu/dpw.htm>.

U.S. Army Garrison. 2009. 2009 status report for the Makua and Oahu implementation plans. U.S. Army Garrison, Hawaii and Pacific Cooperative Park Studies Unit. Schofield Barracks, Hawaii. 711 pages. Available online at <http://www.botany.hawaii.edu/faculty/duffy/DPW.htm>.

U.S. Army Garrison. 2010. 2010 status report for the Makua and Oahu implementation plans. U.S. Army Garrison, Hawaii and Pacific Cooperative Park Studies Unit. Schofield Barracks, Hawaii. 730 pages. Available online at <http://manoa.hawaii.edu/hpicesu/dpw.htm>.

[USFWS] U.S. Fish and Wildlife Service. 1998. Recovery plan for Oahu plants. U.S. Fish and Wildlife Service, Portland, Oregon. 207 pages + appendices. Available online at <<http://www.fws.gov/pacificislands/recoveryplans.html>>.

[USFWS] U.S. Fish and Wildlife Service. 2007. *Cyanea st.-johnii* (haha) 5-year review summary and evaluation. U.S. Fish and Wildlife Service, Honolulu, Hawaii. 10 pages. Available online at <http://ecos.fws.gov/docs/five_year_review/doc1130.pdf>.

Personal communication:

Beachy, Jane. 2011. Ecosystem restoration program manager, Oahu Army Natural Resources Program, Schofield, Hawaii. Email to Patti Clifford, Bernice Pauahi Bishop Museum, dated March 21, 2011. Subject: *Cyanea st.-johnii*.

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

Pre-1996 DPS listing still considered a listable entity? N/A

Recommendation resulting from the 5-year review:

<u> </u>	Delisting
<u> </u>	Reclassify from Endangered to Threatened status
<u> </u>	Reclassify from Threatened to Endangered status
<u> X </u>	No Change in listing status

Appropriate Listing/Reclassification Priority Number, if applicable:

Review Conducted By:

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for

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