

5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Cyrtandra subumbellata* (haiwale)

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 58 species in Washington, Oregon, California, and Hawaii. Federal Register 75(226):71726-71729.

Lead Region/Field Office:

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

Name of Reviewer(s):

Vickie Caraway, Plant Biologist, PIFWO

Chelsie Javar, Plant Biologist, PIFWO

Daniel Clark, Oahu, Kauai, Northwest Hawaiian and American Samoa Islands 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 January 31, 2012. The review was based on a review of current, available information since the last 5-year review for *Cyrtandra subumbellata* (USFWS 2008). The National Tropical Botanical Garden provided an initial draft of portions of the five-year review and recommendations for conservation actions needed prior to the next five-year review. The document was reviewed by the Plant Biologist, Islands Team Manager, and 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).

Review Analysis:

Please refer to the previous 5-year review for *Cyrtandra subumbellata* published on January 18, 2008 (available at

www.fws.gov/ecos/ajax/docs/five_year_review/doc1775.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 *Cyrtandra subumbellata*.

This short-lived shrub is endangered and occurs on the island of Oahu. The current status and trends for *Cyrtandra subumbellata* are provided in the tables below.

New status information:

- The Bulimoides Triangle location had one individual in 2010, and the population in South Kaukonahua Stream, south branch, had no individuals in 2010, down from 20 in 2000 (Oahu Army Natural Resource Program [OANRP] 2011).
- The largest population in the back of Punaluu Valley had 200 individuals in 2011 (OANRP 2011). This Punaluu Valley area, south of Poamoho Trail, was visited in 2011 by Steve Perlman of the National Tropical Botanical Garden and Susan Ching, Oahu Coordinator for the Plant Extinction Prevention Program. Four individuals were seen, with more scattered in the area, in flower and fruit (Perlman 2011), although the OANRP count is likely much more thorough.
- In 2010 and 2011 the OANRP staff reported Kahana had eight mature and seven immature individuals and Uwao had two mature individuals (U.S. Army Garrison 2012, 2011).

The total for all populations was 216 individuals (U. S. Army Garrison 2010; 2011), an increase from 117 in 2008.

New threats:

Climate change - Climate change may 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) funded climate modeling that will help resolve these spatial limitations. High spatial resolution climate outputs are expected to be available sometime in 2013.

New management actions:

- Captive propagation for genetic storage and reintroduction:
 - There were 20 individuals of *Cyrtandra subumbellata* in storage at the Lyon Arboretum Micropropagation Laboratory in 2012 (Harold L. Lyon Arboretum 2012).
 - The U.S. Army has initiated but not completed genetic storage of this species (U. S. Army Garrison 2010).

Synthesis:

Stabilizing, downlisting, and delisting objectives are provided in the recovery plan for Oahu plants (USFWS 1998), based on whether the species is an annual, a short-lived perennial (fewer than 10 years), or a long-lived perennial. *Cyrtandra subumbellata* 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 Oahu. Each of these populations must be naturally reproducing and increasing in number, with a minimum of 50 mature individuals per population.

The stabilization goals for this species have not been met, as only one population of 50 or more mature individuals exists (Table 1) and all threats are not being sufficiently

managed throughout all of the populations (Table 2). Therefore, *Cyrtandra subumbellata* 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 seed collection for genetic storage.
- Predator / herbivore control - Control rodents and slugs around remaining plants.
- Surveys / inventories - Survey for additional populations.
- Population biology research
 - Study 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.
 - Study hybridization amongst Hawaiian species of *Cyrtandra* to determine whether hybridization poses a significant threat to *Cyrtandra subumbellata*.
- Threats research - Continue studies on slug control.
- Alliance and partnership development - Initiate planning and contribute to implementation of ecosystem-level management and restoration to benefit this species.

Table 1. Status and trends of *Cyrtandra subumbellata* from listing through current 5-year review.

Date	No. wild individuals	No. outplanted	Stability Criteria identified in Recovery Plan	Stability Criteria Completed?
1996 (listing)	<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)	<50	0	All threats managed in 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)	117	0	All threats managed in 3 populations	Partially
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	Partially
2013 (5-yr review)	216	0	All threats managed in all 3 populations	Partially (Table 2)
			Complete genetic storage	No
			3 populations with 50 mature individuals each	Partially, 1 population

Table 2. Status of threats to *Cyrtandra subumbellata* and ongoing conservation efforts

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Ungulates – habitat modification and herbivory	A, C, D, E	Ongoing	None
Slugs	E		None
Fire – habitat modification and plant destruction	A, E	Ongoing	None
Invasive introduced plants	A, E	Ongoing	None
Climate change	A, E	Increasing	None

References:

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

Harold L. Lyon Arboretum. 2012. Micropropagation database. University of Hawaii at Manoa, Honolulu, Hawaii. Unpublished.

Perlman, Steve. 2011. *Cyrtandra subumbellata* data. 1 page. Unpublished.

Oahu Army Natural Resource Program. 2011. Population summary report for *Cyrtandra subumbellata* 3 pages. Unpublished.

U.S. Army Garrison. 2010. 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://manoa.hawaii.edu/hpicesu/DPW/2010_YER/default.htm>.

U.S. Army Garrison. 2011. Status report for the Makua and Oahu implementation plans. U.S. Army Garrison, Hawaii and Pacific Cooperative Park Studies Unit. Schofield Barracks, Hawaii. 269 pages. Available online at <http://manoa.hawaii.edu/hpicesu/DPW/2011_YER/default.htm>.

[USFWS] U.S. Fish and Wildlife Service. 1998. Recovery plan for the Oahu plants. U.S. Fish and Wildlife Service, Portland, Oregon. 207 pages, plus appendices.

[USFWS] U.S. Fish and Wildlife Service. 2008. *Cyrtandra subumbellata* (haiwale) 5-year review summary and evaluation. U.S. Fish and Wildlife Service, Honolulu, Hawaii. 10 pages. Available online at <www.fws.gov/ecos/ajax/docs/five_year_review/doc1775.pdf>.

U.S. FISH AND WILDLIFE SERVICE
SIGNATURE PAGE for 5-YEAR REVIEW of *Cyrtandra subumbellata* (haiwale)

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

acting deputy
Field Supervisor, Pacific Islands Fish and Wildlife Office

Maire M. Buegman

Date 2013-08-01