

## **5-YEAR REVIEW**

Short Form Summary

**Species Reviewed:** *Cyrtandra polyantha* (Haiwale)

**Current Classification:** Endangered

### **Federal Register Notice announcing initiation of this review:**

[USFWS] U.S. Fish and Wildlife Service. 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.

### **Lead Region/Field Office:**

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

### **Name of Reviewer(s):**

Fred Amidon, Pacific Islands Fish and Wildlife Office, Fish and Wildlife Biologist  
Marie Bruegmann, Pacific Islands Fish and Wildlife Office, Plant Recovery Coordinator  
Marilet A. Zablan, Pacific Islands Fish and Wildlife Office, Recovery Program Leader and acting Assistant Field Supervisor for Endangered Species

### **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) in 2008. The review was based on the proposed rule and final critical habitat designation for *Cyrtandra polyantha* and other species from the island of Oahu, as well as a review of current, available information. The Bernice P. Bishop Museum provided an initial draft of portions of the 5-year review and they also provided 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 our 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.

### **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](http://ecos.fws.gov/tess_public)).

### **Application of the 1996 Distinct Population Segment (DPS) Policy:**

This Policy does not apply to plants.

**Review Analysis:**

Please refer to the final critical habitat designation for *Cyrtandra polyantha* published in the Federal Register on June 17, 2003 (USFWS 2003a) for a complete review of the species' status (including biology and habitat), threats, and management efforts. No new threats and 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. polyantha*.

Historically, *Cyrtandra polyantha* was known from the Kalihi region and from Kulepiamoia Ridge above Niu Valley on the leeward (facing southwest) side of the southern Koolau Mountains (USFWS 2003a). At the time of Federal listing in 1994 two populations, located further south on Kuliouou summit ridge and at the northwest head of Hahaione Valley, were known, but the number of extant individuals was undetermined. In 2007, 46 mature individuals were known to occur in two populations (USFWS 2008). The Kulepeamoia population, on the leeward side of the Koolau Mountains, consisted of a single mature individual, and the Kuliouou Valley summit population on the windward side of the Koolau Mountains consisted of 45 mature individuals. The extant wild population appears to be in good health, although numbers appear to be declining with time. J. Lau (private consultant) predicted that very few additional plants will be found along the ridge between Kuliouou and Waimanalo (USFWS 2008). In addition, the populations are difficult to access, requiring rappelling for monitoring and fruit collection.

*Cyrtandra polyantha* grows on ridges in *Metrosideros polymorpha* (ohia) mesic or wet forests at elevations between 331 and 762 m (1,086 and 2,499 ft). *Cyrtandra polyantha* was also observed to flower in October, with fruit maturing between December and January (Plant Extinction Prevention Program 2007). However, little else is known about seed dispersal agents, longevity, specific environmental requirements, and limiting factors (USFWS 1998, 2003a and b).

A major threat to *Cyrtandra polyantha* is habitat degradation by feral pigs (*Sus scrofa*) (Factor A). Competition from invasive introduced plant species (Factor E) is another major threat, competing for light, space and water resources. The most serious plant species impacting *C. polyantha* include *Ageratina adenophora* (pamakani haole), *Clidemia hirta* (Koster's curse), *Erigeron karvinskianus* (daisy fleabane), and *Melinis minutiflora* (molasses grass). The inaccessibility of the extant populations affords the species some protection from human trampling and collection (Factor B) (Plant Extinction Prevention Program 2007; USFWS 2007). However, the over-collection of plant material and genetic resources for scientific purposes could threaten the species due to the small number of remaining individuals, and potentially reduced reproductive vigor (Factor E). *Cyrtandra polyantha* produces white fleshy fruits which are potentially eaten by rats (*Rattus* spp.), and rats therefore potentially threaten the survival of the taxon (Factor C) (USFWS 2007). Herbivory by slugs and snails may also impact the survival of the remaining populations (Factor C) (USFWS 1998).

In addition to all of the other threats, species like *Cyrtandra polyantha* that are endemic to small portions of a single island are inherently more vulnerable to extinction than widespread species because of the higher risks posed to a few populations and individuals by random demographic fluctuations and localized catastrophes such as hurricanes, landslides, flooding and disease outbreaks (Factor E). When considered on their own, the natural processes associated with being a single island endemic do not affect *C. polyantha* to such a degree that it is threatened or endangered with extinction in the foreseeable future, but these natural processes can exacerbate the threat from anthropogenic factors, such as habitat loss for human development or predation by introduced species (Factor E) (USFWS 1998).

To safeguard existing genetic material, the Lyon Arboretum houses more than 16,000 seeds from 14 individuals, and 694 individuals in micropropagation from the Kuliouou population (Plant Extinction Prevention Program 2007). Pahole Rare Plant Facility has 39 seedlings of *Cyrtandra polyantha* from the Kuliouou population. A single population of 18 individuals has also been established in a fenced enclosure near Kulepeamoia Ridge in Kupaua Valley, and these individuals have been observed to flower and fruit (Plant Extinction Prevention Program 2007).

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. *Cyrtandra polyantha* 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. For the species to be considered stable, 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 (see Table 1), as there are no populations with 50 mature individuals. Therefore, *Cyrtandra polyantha* meets the definition of endangered as it remains in danger of extinction throughout its range.

#### **Recommendations for Future Actions:**

- Collect genetic material from extant mature individuals for establishment of new populations or enhancement of existing populations.
- Construct fences and remove ungulates from wild populations and control invasive introduced plant species.
- Survey the geographical and historical range of *Cyrtandra polyantha* for additional populations.
- Conduct life history studies, including pollination and seed dispersal research.

**References:**

- Plant Extinction Prevention Program. 2007. Annual performance report (July 1, 2006 to June 30, 2007), Plant Extinction Prevention (PEP) program for Oahu, Maui Nui, Hawaii.
- USFWS 1998. Recovery plan for the Oahu plants. U.S. Fish and Wildlife Service, Portland, OR.
- USFWS. 2003a. Endangered and threatened wildlife and plants; final designations or nondesignations of critical habitat for 101 plant species from the island of Oahu, HI; final rule. Federal Register 68:35950–36406.
- USFWS. 2003b. Biological Opinion of the U.S. Fish and Wildlife Service for routine military training and transformation of the 2<sup>nd</sup> Brigade 25<sup>th</sup> Infantry Division (Light), U.S. Army Installations, island of Oahu.
- [USFWS] U.S. Fish and Wildlife Service. 2008. Rare plant tracking database. May 1, 2008. Unpublished.

**Table 1. Status of *Cyrtdandra polyantha* 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>Stability Criteria Completed?</b>
1994 (listing)	Unknown	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
1998 (recovery plan)	5	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2003 (critical habitat)	3	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2008 (5-year review)	46	18	All threats managed	Partially
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No

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SIGNATURE PAGE for 5-YEAR REVIEW of *Cyrtandra polyantha*

**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

**Field Supervisor, Pacific Islands Fish and Wildlife Office**

  
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Patrick Leonard

Date   4/8/09