

5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Cyrtandra crenata* (ha‘iwale)

Current Classification: Endangered

Federal Register Notice announcing initiation of this review:

[USFWS] U.S. Fish and Wildlife Service. 2017. Endangered and threatened wildlife and plants; initiation of 5-year status reviews for 138 species in Hawaii, Oregon, Washington, and California. Federal Register 82(75): 18665–18668.

Lead Region/Field Office:

Region 1/Pacific Islands Fish and Wildlife Office (PIFWO), Honolulu, Hawai‘i

Name of Reviewer(s):

Cheryl Phillipson, Biologist, PIFWO

Lauren Weisenberger, Plant Recovery Coordinator, PIFWO

Megan Laut, Conservation & Restoration Team Manager, PIFWO

Methodology used to complete this 5-year review:

This review was conducted by staff of the Pacific Islands Fish and Wildlife Office (PIFWO) of the U.S. Fish and Wildlife Service (Service) beginning in October, 2018. The review was based on a review of current, available information since the last 5-year review for *Cyrtandra crenata* (USFWS 2011). The evaluation completed by Cheryl Phillipson, Biologist, was reviewed by Lauren Weisenberger, Plant Recovery Coordinator, and Megan Laut, Conservation and Restoration Team Manager.

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 crenata* published in the Federal Register on August 2, 2011 (available at http://ecos.fws.gov/docs/five_year_review/doc3819.pdf) for a complete review of the species’ status, threats, and management efforts. We are not aware of any significant new information regarding the species’ biological status since listing to warrant a change in the Federal listing status of *C. crenata*.

This short-lived perennial shrub in the Gesneriaceae (African violet) family is endemic to O‘ahu. The current status and trends for *Cyrtandra crenata* are provided in the tables below.

New Status Information:

- No individuals of *Cyrtandra crenata* have been observed since 1947. Enquiries were made of species experts in 2010 and they proposed that *Cyrtandra crenata* is

likely a hybrid between *C. hawaiiensis* and *C. subumbellata*, as reexamination of vouchers revealed, and both these species occurred in the same area (Kawelo 2010, in litt.; Lau 2010, in litt.; Perlman 2010, in litt.; Wagner 2010, in litt.). The Plant Extinction Prevention Program (PEPP) reassessed this species in 2013 and concluded that *C. crenata* is extinct, and in 2016, the International Union for the Conservation of Nature (IUCN) assessed the current status of *C. crenata* as “Critically Endangered (Possibly Extinct)” (PEPP 2013; Keir *et al.* 2016). A new monograph of Hawaiian *Cyrtandra* and genetic studies are in preparation through which the status of *C. crenata* may be determined (Roalson 2018, in litt.; Wagner 2018, in litt.). We will reassess this species pending the results of these publications.

New Threats:

- Climate change loss or degradation of habitat—Climate change may pose a threat to this species. Fortini *et al.* (2013) conducted a landscape-based assessment of climate change vulnerability for native plants of Hawai‘i using high resolution climate change projections. Climate change vulnerability is defined as the relative inability of a species to display the possible responses necessary for persistence under climate change. The assessment by Fortini *et al.* (2013) concluded that *Cyrtandra crenata* is highly vulnerable to the impacts of climate change, with a vulnerability score of 0.784 (on a scale of 0 being not vulnerable to 1 being extremely vulnerable to climate change). In addition, the analysis concluded that this species has no overlap between current and future climate envelopes, and is unlikely to tolerate expected changes in climate at its last known location. This means that this species must persist within suitable microrefugia, or move to newly available climate-compatible areas to avoid extinction. Therefore, additional management actions may be needed to conserve this taxon into the future.

New Management Actions:

- None reported.

Synthesis:

The last observation of one occurrence of *Cyrtandra crenata* on O‘ahu was reported in 1947. There are no seed collections or any other genetic material in storage or propagation. A landscape-based assessment of climate change vulnerability for native plants of Hawai‘i using high resolution climate change projections was made by Fortini *et al.* (2013) and their analysis showed that *C. crenata* is highly vulnerable to the effects of climate change. The status of this species may be reconsidered following publication of a new monograph for Hawaiian *Cyrtandra* and publication of other pending genetic studies.

Stabilizing (interim), downlisting, and delisting objectives were provided in the Recovery Plan for the O‘ahu Plants (USFWS 1998), and have been updated according to the draft revised recovery objective guidelines developed by the Hawai‘i and Pacific Plants Recovery Coordinating Committee (HPPRCC 2011). The HPPRCC identifies an

additional initial objective, the Preventing Extinction Stage, in addition to the Interim Stabilization, Delisting, and Downlisting objectives. Furthermore, life history traits such as breeding system, population size fluctuation or decline, and reproduction type (sexual or vegetative), have been included in the calculation of goals for the number of populations and reproducing individuals for each stage. The goals for each stage remain grouped by life span defined as annual, short-lived perennial (fewer than 10 years), or long-lived perennial.

Cyrtandra crenata is a short-lived perennial shrub. To prevent extinction, which is the first step in recovering the species, the taxon must be managed to control threats (*e.g.*, fenced) and have 50 individuals (or the total number of individuals if fewer than 50 exist) from each of three populations represented in an *ex situ* (secured off-site, such as a nursery or seed bank) collection. In addition, a minimum of three populations should be documented on O‘ahu where they now occur or occurred historically and each of these populations must be naturally reproducing (*i.e.*, viable seeds, seedlings, saplings), with a minimum of 50 mature, reproducing individuals per population.

The preventing extinction goals for this species have not been met (Table 1). There is no genetic material in propagation or in storage (Table 2), there are no known individuals observed the wild since 1947, and all threats are not being managed. Therefore, *Cyrtandra crenata* meets the definition of Endangered as it remains in danger of extinction throughout its range.

Recommendations for Future Actions:

Other than the new data on this taxon’s vulnerability to climate change, we are not aware of any new threats. There is no significant new information regarding the species’ biological status since the last 5-year review in 2011. Thus, the following recommendations for future actions are reiterated for the 5-year review for 2019.

- Surveys and monitoring—Continue to survey the last known locations of this species, and monitor individuals if found.
- Invasive plant monitoring and control—If the species is relocated, control established ecosystem-altering nonnative invasive plant species, and those that compete with *C. crenata*.
- Climate change adaptation strategy—If the species is relocated, research the suitability of habitat for reintroduction of this species in the future due to impacts of climate change.
- Captive propagation for genetic storage and reintroduction—If the species is relocated begin collection and propagation efforts for maintenance of genetic stock.
- Reintroduction and translocation—If the species is relocated, reintroduce individuals into suitable habitat within historic range that is being managed for known threats to this species.
- When the new monograph of the genus is published, consider whether this species should be delisted.

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

Date	No. wild individuals	No. outplanted	Stabilization Criteria identified in Recovery Plan	Stabilization Criteria Completed?
1994 (listing)	0	0	All threats managed in all three populations	No
			Complete genetic storage	No
			Three populations with 50 mature individuals each	No
1998 (recovery plan)	0	0	All threats managed in all three populations	No
			Complete genetic storage	No
			Three populations with 50 mature individuals each	No
2003 (critical habitat, none designated)	0	0	All threats managed in all three populations	No
			Complete genetic storage	No
			Three populations with 50 mature individuals each	No
2011 (5-year review)	0	0	All threats managed in all three populations	No
			Complete genetic storage	No
			Three populations with 50 mature individuals each	No
Date	No. wild individuals	No. outplanted	*Preventing Extinction Criteria identified by HPPRCC	*Preventing Extinction Criteria Completed?

2019 (5-year review)	0	0	All threats managed in all three populations	No
			Complete genetic storage	No
			Reproduction (<i>i.e.</i> viable seeds, seedlings) at all three populations	No
			Three populations with 50 mature individuals each	No

* The Preventing Extinction Stage was established in 2011. Prior to 2011, the Interim Stabilization Stage was the first stage towards recovery (now it is the second after Preventing Extinction).

Table 2. Threats to *Cyrtandra crenata* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Climate change degradation or loss of habitat	A	Ongoing	None
Reduced viability due to low numbers	E	Ongoing	None

References:

See previous 5-year review for a full list of references (USFWS 2011). Only references for new information are provided below.

Fortini, L., J. Price, J. Jacobi, A. Vorsino, J. Burgett, K. Brinck, F. Amidon, S. Miller, S. Gon II, G. Koob, and E. Paxton. 2013. A landscape-based assessment of climate change vulnerability for all native Hawaiian plants. Technical report HCSU-044. Hawaii Cooperative Studies Unit, University of Hawaii at Hilo, Hawaii. 134 pp.

Kawelo, K. 2010, in litt., Email to Bruegmann regarding the current status of *Cyrtandra crenata* on O‘ahu, 18 MAY 2010.

Keir, M., S.M. Gon, N. Sugii, J. Kwon, M. Chau, M. Bruegmann, V.L. Caraway, M. Sporck-Koehler, and L. Weisenberger. 2016. *Cyrtandra crenata*. The IUCN Red List of Threatened Species 2016: e.T78787179A115497354. <http://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T78787179A78787767.en>.

Lau, J. 2010, in litt., Email to Bruegmann regarding the current status of *Cyrtandra crenata* on O‘ahu, 16 MAY 2010.

- [HPPRCC] Hawai'i and Pacific Plants Recovery Coordinating Committee. 2011. Revised recovery objective guidelines. 8 pp.
- Perlman, S. 2010, in litt., Email to Brueggemann regarding the current status of *Cyrtandra crenata* on O'ahu, 18 MAY 2010.
- [PEPP] Plant Extinction Prevention Program. 2013. Annual report fiscal year 2013 (July 1, 2012-June 30, 2013). 207 pp.
- Roalson, E. 2018, in litt., Email to USFWS regarding current status of *Cyrtandra crenata*, 30 OCT 2018.
- [USFWS] U.S. Fish and Wildlife Service. 2011. *Cyrtandra crenata* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. http://ecos.fws.gov/docs/five_year_review/doc3819.pdf.
- [USFWS] 2017. Endangered and threatened wildlife and plants; initiation of 5-year status reviews for 138 species in Hawai'i, Oregon, Washington, and California. Federal Register 82(75): 18665–18668, April 20, 2017.
- Wagner, W. 2010, in litt., Email to Brueggemann regarding the current status of *Cyrtandra crenata* on O'ahu, 18 MAY 2010.
- Wagner, W. 2018, in litt., Email to USFWS and Roalson regarding the current status of *Cyrtandra crenata*, 6 NOV 2018.

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SIGNATURE PAGE for 5-YEAR REVIEW of *Cyrtandra crenata* (ha'iwale)

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
- X No Change in listing status

For Field Supervisor, Pacific Islands Fish and Wildlife Office

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