

## 5-YEAR REVIEW

Short Form Summary

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

**Current Classification:** Endangered

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

[USFWS] U.S. Fish and Wildlife Service. 2022. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status reviews for 167 Species in Oregon, Washington, Idaho, Montana, California, Hawaii, Guam, and the Northern Mariana Islands. Federal Register 87(90): 28031–28034, May 10, 2022.

**Lead Region/Field Office:**

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

**Name of Reviewer:**

Cheryl Phillipson, Biologist, PIFWO

Lauren Weisenberger, Plant Recovery Coordinator, PIFWO

Megan Laut, Recovery Program 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 2023. The review was based on a review of current, available information since the last 5-year review for *Cyrtandra kaulantha* (USFWS 2019). The evaluation by Cheryl Phillipson, Biologist, was reviewed by Lauren Weisenberger, Plant Recovery Coordinator, and Megan Laut, Recovery Program 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/ecp/species/4812>).

**Review Analysis:**

Please refer to the previous 5-year review for *Cyrtandra kaulantha* published in the Federal Register on August 30, 2019 (available at [https://ecos.fws.gov/docs/tess/species\\_nonpublish/2786.pdf](https://ecos.fws.gov/docs/tess/species_nonpublish/2786.pdf)) for a complete review of the species’ status, threats, management efforts, and references cited. 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. kaulantha*.

This short-lived perennial shrub in the Gesneriaceae (African violet) family is endangered and is known from the island of O‘ahu. The status and trends for *Cyrtandra kaulantha* are provided in the tables below.

#### New Status Information:

- Currently, one wild population on the windward side of the northern Ko‘olau mountains of O‘ahu totals as many as 16 mature individuals (PEPP 2019–2023; Ching 2024, pers. comm.). Reintroductions have all declined or are gone since outplanting: at Kaluanui no plants remain; of the 25 individuals at Kīpapa in 2019, no plants remain; of the 12 individuals at Waianu only two plants remain; of the 20 individuals at Manuwai only 5 remained in 2019; and, of the 53 individuals at Waikāne in 2019, only two plants remain (Ching 2024, pers. comm.). The *inter situ* population at Wahiawā Botanic Garden has died. The *inter situ* population at Lyon Arboretum consisted of 18 immature individuals in 2020; however, its current status is not reported.
- Currently, at least 12 founders from one wild population are represented in *ex situ* storage and propagation collections, including stored seeds, explants in tissue culture, and plants in a nursery (Lyon Arboretum 2022; Native Ecosystems Protection & Management [NEPM] 2020; O‘ahu Rare Plant Nursery 2023; Pahole Rare Plant Facility 2019).

#### New Threats:

- None reported.

#### New Management Actions:

- Monitoring and surveys—The Plant Extinction Prevention Program (PEPP) continues to monitor individuals of *Cyrtandra kaulantha* in the Ko‘olau mountains of O‘ahu (PEPP 2020, p. 26).
- Rodent monitoring and control—In 2020, PEPP used traps to manage rodents at one population of *C. kaulantha* (PEPP 2020, p. 7).
- Invertebrate monitoring and control—In 2020, PEPP reported use of molluscicides to control slugs and nonnative snails at one population of *C. kaulantha* (PEPP 2020, p. 8),
- Collection and propagation for genetic storage and reintroduction—
  - In 2022, the Lyon Arboretum Micropropagation Laboratory reported a total of 576 explants in storage representing seven founders at Waianu, and 152 explants representing two individuals at Waikāne (Lyon Arboretum 2022). In 2022, the Lyon Arboretum Seed Conservation Laboratory reported 152,321 seeds in storage representing 13 founders at Waianu, 8,040 seeds representing two individuals at Waikāne, and 5,530 seeds representing one plant propagated from leaf tissue.
  - The State’s O‘ahu rare plant nursery reported propagation and storage of 90 plants representing 17 founders from Waianu, 13 plants representing one individual at Waikāne, and two plants representing one outplanted individual at Kaluanui (O‘ahu Rare Plant Nursery [ORPN] 2023). In 2019, the Pahole Rare Plant Facility (PRPF) reported propagation of 152 plants representing the same 17 founders at Waianu and 31 plants representing the same individual at Waikāne, a reintroduction (PRPF 2019). The State’s Native Ecosystems Protection and Management (NEPM) program reported propagation of 386 plants representing three of the same founders and two unique founders at

Waianu (NEPM 2020). NEPM also reported storage of 3,582 seeds representing three founders at Waianu (along with more than 3,000 seeds from a greenhouse plant sourced from Waianu), 36 apical samples representing one founder at Waianu, 34 apical samples representing one individual at Waikāne, and propagation from 36 leaf samples representing a second outplanted individual at Waikāne (NEPM 2020).

**Table 1. Status and trends of *Cyrtandra kaulantha* from listing through current 5-year review with progress according to Preventing Extinction Goals.**

<b>Date</b>	<b>No. wild individuals</b>	<b>No. Outplanted</b>	<b>*Preventing Extinction Targets identified by HPPRCC</b>	<b>*Preventing Extinction Targets Completed?</b>
<b>2012 (listing)</b>	28	31	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
<b>2019 (5-year review)</b>	16–22	46	All threats managed in all 3 populations	No
			Complete genetic storage	Yes
			3 populations with 50 mature individuals each	No
<b>2024 (5-year review)</b>	ca 16 mature	ca 100, only 4 survive	All threats managed in all 3 populations	Partially
			Complete genetic storage	Yes
			3 populations with 50 mature individuals each	No

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

<b>Threat</b>	<b>Listing factor</b>	<b>Current Status</b>	<b>Conservation/ Management Efforts</b>
Degradation and destruction of habitat by feral ungulates	A	Ongoing	Partial, at least 2 occurrences fenced
Degradation of habitat by established ecosystem-altering nonnative invasive plants	A	Ongoing	Partial, nonnative plant control at all populations
Landslides and erosion destruction of habitat	A	Ongoing	None
Climate change degradation or loss of habitat	A	Ongoing	None
Predation and herbivory by rodents	C	Ongoing	None
Predation and herbivory by invertebrates—Slugs and snails	C	Ongoing	None
Hybridization	E	Ongoing	None
Reduced viability due to low numbers	E	Ongoing	Partial, collection, propagation, and reintroduction

**Synthesis:**

Currently there are at least 16 mature wild individuals of *Cyrtandra kaulantha* in one population on O‘ahu. Two reintroduction areas are fenced, with rodent or slug/snail control. Seed collections and propagation represent at least 12 founders from Waianu. Although nearly 100 individuals were translocated, very few (four) currently survive.

Stabilizing (interim) and preventing extinction targets, and downlisting and delisting criteria are recommended based on 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 kaulantha* is a short-lived perennial shrub. To prevent extinction, which is the first milestone 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 *ex situ* (secured off-site, such as a nursery or seed bank) collections that are well managed. In addition, a minimum of a

total 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) with a minimum of 50 mature, reproducing individuals per population.

The preventing extinction goals for this species have not been met. Although genetic representation is complete (Table 1), there are no single populations totaling at least 50 reproducing individuals, and not all threats are being managed (Table 1, Table 2). Reintroductions are not successful, and no recruitment has been reported. Therefore, *Cyrtandra kaulantha* meets the definition of Endangered as it remains in danger of extinction throughout its range.

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

No significant new information regarding the species’ biological status has been reported since the last 5-year review in 2019. Thus, the following recommendations for future actions are updated or reiterated for the 5-year review for 2024.

- Surveys and inventories—Continue to survey for *Cyrtandra kaulantha* in historical locations and potentially suitable habitat to assess current status.
- Ungulate monitoring and control—Continue to construct exclosures to protect habitat from the negative impacts of feral ungulates.
- Invasive nonnative plant monitoring and control—Continue to control established ecosystem-altering nonnative invasive plant species and those that compete with *C. kaulantha*.
- Landslides—Continue to fence and control feral ungulates to prevent erosion leading to landslides. Possibly relocate or augment populations outside of the possible range of landslide events.
- Climate change adaptation strategy—Research suitability of habitat for viability of species due to the impacts of climate change.
- Predator and herbivore monitoring and control—Determine and implement effective methods for rodents and slugs/snails within the vicinity of all known *C. kaulantha* populations.
- Captive propagation for genetic storage and reintroduction—Continue collection and propagation efforts for maintenance of genetic stock and for reintroduction.
- Reintroduction and augmentation—Determine more suitable reintroduction sites and continue translocation efforts to more suitable areas where threats are controlled.
- Hybridization—
  - Assess genetic variability within the extant population and evaluate the risk posed by possible hybridization with other *Cyrtandra* species.
  - Collect cuttings and seeds from tagged individuals keeping close track of the maternal source used for propagation.
- Build resiliency, redundancy, and representation—Increase species’ viability through habitat restoration, threat control, and reintroduction and translocation into suitable habitat that is being managed for known threats to this species to reduce impacts of small population size, landslides and predation.

- Alliance and partnership development—Continue to plan and contribute to implementation of ecosystem-level restoration and management to benefit this species.

## References:

Ching, S. 2024, pers. comm. Email regarding current status of *Cyrtandra kaulantha*, 11 MAR 2024.

[HPPRCC] Hawai‘i and Pacific Plants Recovery Coordinating Committee. 2011. Revised recovery objective guidelines. 8 pp.

Lyon Arboretum. 2022. Report on controlled propagation of listed species, as designated under the U.S. Endangered Species Act. Unpublished report submitted to the U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office, Honolulu, Hawai‘i.

[NEPM] Native Ecosystems Protection & Management Program. 2020. Report on controlled propagation of listed species, as designated under the U.S. Endangered Species Act. Unpublished report submitted to the U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office, Honolulu, Hawai‘i.

[ORPN] O‘ahu Rare Plant Nursery. 2023. Report on controlled propagation of listed species, as designated under the U.S. Endangered Species Act. Unpublished report submitted to the U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office, Honolulu, Hawai‘i.

[PRPF] Pahole Rare Plant Facility. 2019. Report on controlled propagation of listed species, as designated under the U.S. Endangered Species Act. Unpublished report submitted to the U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office, Honolulu, Hawai‘i.

[PEPP] Plant Extinction Prevention Program. 2020. Plant Extinction Prevention Program fiscal year 2020 interim performance report (October 1, 2019-September 30, 2020), Cooperative Agreement F18AC00502 (Interim report), F19AC00532 (Interim report), U.S. Fish and Wildlife Service CFDA Program #15.657 Endangered Species Conservation—Recovery Implementation Funds, University of Hawai‘i at Mānoa, Pacific Cooperative Studies Unit, Plant Extinction Prevention Program. 70 pp.

[PEPP] 2019–2023. Plant Extinction Prevention Program fiscal years 2019 to 2023 interim performance report (October 1, 2018-September 30, 2023). U.S. Fish and Wildlife Service CFDA Program #15.657 Endangered Species Conservation—Recovery Implementation Funds, Cooperative Agreement: F18AC00502 (Final performance report), University of Hawaii at Manoa, Pacific Cooperative Studies Unit. 105 pp. + database.

[USFWS] U.S. Fish and Wildlife Service. 2019. *Cyrtandra kaulantha* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. [https://ecos.fws.gov/docs/five\\_year\\_review/doc/2786.pdf](https://ecos.fws.gov/docs/five_year_review/doc/2786.pdf).

[USFWS] 2022. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status reviews for 167 Species in Oregon, Washington, Idaho, Montana, California, Hawaii, Guam, and the Northern Mariana Islands. Federal Register 87(90): 28031–28034, May 10, 2022.

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SIGNATURE PAGE for 5-YEAR REVIEW of *Cyrtandra kaulantha* (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
- No Change in listing status

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

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