

## 5-YEAR REVIEW

Short Form Summary

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

**Current Classification:** Endangered

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

[USFWS] U.S. Fish and Wildlife Service. 2023. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status reviews for 133 Species in Oregon, Washington, Idaho, Montana, California, Hawaii, Guam, and the Northern Mariana Islands. Federal Register 88(56): 17611–17614, March 23, 2023.

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

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

### **Name of Reviewer:**

Daniel Adamski, 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 tintinnabula* (USFWS 2020). The evaluation by Daniel Adamski, 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 (<https://ecos.fws.gov/ecp/species/5755>).

### **Review Analysis:**

Please refer to the previous 5-year reviews for *Cyrtandra tintinnabula* published in the Federal Register on August 28, 2012 (available at [https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public\\_docs/species\\_nonpublish/3184.pdf](https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/3184.pdf)), and on September 29, 2020 (available at [https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public\\_docs/species\\_nonpublish/3150.pdf](https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/3150.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. tintinnabula*.

This short-lived perennial shrub in the Gesneriaceae (African violet) family is endangered and found on the island of Hawai‘i. The status and trends for *Cyrtandra tintinnabula* are provided in the tables below.

#### New Status Information:

- At the time of the previous five-year review in 2020, there were estimated to be between 90 and 170 wild individuals across three locations on the island of Hawai‘i; ‘Ōla‘a trench in Hawai‘i Volcanoes National Park (HVNP), Laupāhoehoe Natural Area Reserve (NAR), and at Maulua Unit of Hakalau Forest National Wildlife Refuge (HFNWR). There has been no reported monitoring since that time, and the current estimate is unknown. There were 20 plants in HVNP last monitored in 2014. There were 19 plants at HFNWR in 2005, but heavy pig activity is noted in the area. The population was last visited in 2014. Also in 2014, PEPP estimated there to be 50 to 100 individuals in Laupāhoehoe NAR (HFNWR 2024; HVNP 2024; PEPP 2024).
- Currently, there are 12 founder lines represented in *ex situ* storage and propagation collections, including seeds in seed banks, explants in micropropagation, and plants in a living collection (HFNWR 2024; Lyon Arboretum 2024; Volcano Rare Plant Facility [VRPF] 2024; National Tropical Botanical Garden [NTBG] 2025).

#### New Threats:

- None

#### New Management Actions:

- Monitoring and surveys—PEPP and staff at HVNP and HFNWR monitor populations of *Cyrtandra tintinnabula* on the island of Hawai‘i, but there have been no reported surveys since 2020 (PEPP 2024; HVNP 2024).
- Ungulate monitoring and control—PEPP, HVNP, and HFNWR monitor and maintain fences to protect some individuals from ungulates (PEPP 2024).
- Collection and propagation for genetic storage and reintroduction—
  - Lyon Arboretum Micropropagation Laboratory reports 327 explants in micropropagation representing three founders from Laupāhoehoe NAR, and Lyon Arboretum Seed Conservation Laboratory reports 2,938 seeds in storage representing one founder from Laupāhoehoe NAR (Lyon Arboretum 2024).
  - Volcano Rare Plant Facility (VRPF) reports 10 total plants in a living collection representing eight total founders, two from Hakalau, four from Laupāhoehoe NAR, and two from ‘Ōla‘a (VRPF 2024).
  - NTBG reports 1,600 seeds in storage, collected from one individual in 1994, viability is uncertain (NTBG 2025).

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

<b>Date</b>	<b>No. wild individuals</b>	<b>No. outplanted</b>	<b>Stabilization Criteria identified in Recovery Plan</b>	<b>Preventing Extinction Targets Completed?</b>
<b>1996 (Listing)</b>	18	0	All threats managed in the 3 populations	No
			Complete genetic storage	No
			3 populations with 50 individuals each	No
<b>2012 (5-year review)</b>	>150	3	All threats managed in the 3 populations	Partially
			Complete genetic storage	Partially
			3 populations with 50 individuals each	Partially
<b>2020 (5-year review)</b>	90–170	11 planted	All threats managed in the 3 populations	Partially
			Complete genetic storage	Partially
			3 populations with 50 individuals each	Unknown
<b>2025 (5-year review)</b>	Unknown (likely <90)	0–11	All threats managed in the 3 populations	Partially; some individuals fenced
			Complete genetic storage	Partially
			Reproduction (i.e., viable seeds, seedlings, saplings) at all 3 populations	Unknown
			3 populations with 50 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 stage after Preventing Extinction).

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

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Ungulate destruction and degradation of habitat	A	Ongoing	Partial, exclosures at Laupāhoehoe, ‘Ōla‘a, and Hakalau NWR
Established ecosystem altering invasive plant species degradation of habitat	A	Ongoing	Partial, nonnative plant control around exclosures
Degradation and destruction by fire	A	Ongoing	Partial, fire breaks and fire management plan
Climate change and degradation of habitat	A	Ongoing	None
Loss of mutualists	E	Ongoing	None
Hybridization	E	Ongoing	Partial, reintroduction of individuals to areas without other <i>Cyrtandra</i> species
Loss of vigor due to low numbers	E	Ongoing	Partial, collection, propagation, and reintroduction

**Synthesis:**

Currently there are an unknown number of individuals in three locations on Hawai‘i island. Estimates of approximately 90–170 wild individuals of *Cyrtandra tintinnabula* were last reported around 2014. Some individuals are provided protection from ungulates by fencing. Propagation and storage are ongoing, though no monitoring, collections, or translocations have been reported over the last five years.

Stabilizing (interim) targets, and Downlisting and Delisting Criteria were provided in the Recovery Plan for Big Island Plant Cluster (USFWS 1996), 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. 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 tintinnabula* 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 the island of Hawai‘i, 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 (Table 1). There are not three populations with 50 reproducing individuals, all threats are not being managed, and genetic storage is not complete (Table 2). Therefore, *Cyrtandra tintinnabula* 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 2020. Thus, the following recommendations for future actions are updated or reiterated for the 5-year review for 2025.

- Surveys and monitoring—
  - Initiate a monitoring schedule for known populations of *Cyrtandra tintinnabula* to assess resiliency and make collections.
  - Continue surveys for populations of *Cyrtandra tintinnabula* in areas of potentially suitable habitat.
  - Determine suitable locations for reintroductions.
- Ungulate monitoring and control—Monitor and maintain fenced exclosures and construct new fences to protect individuals from the negative impacts of browsing by ungulates.
- Invasive nonnative plant monitoring and control—Control established ecosystem-altering nonnative invasive plant species, and those that compete with *Cyrtandra tintinnabula*.
- Site and habitat protection—Develop and implement effective control measures to reduce the impacts of destruction by fire.
- Fire prevention and control—Continue to develop and implement fire prevention management plans.
- Climate change adaptation strategy—Research suitability of habitat for viability of species, including where to conduct translocations in the future due to the impacts of climate change, and loss of vigor due to low numbers of wild plants.
- Captive propagation for genetic storage and reintroduction—Continue to maintain collection and propagation efforts for maintenance of genetic stock and for reintroduction.
- 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 hybridization and limited numbers.
- Research—Investigate plant-pollinator interactions and limitations from any observed loss of mutualists. Conduct studies on possible hybrid species and use genetic analysis to determine taxonomy of known populations.

- Alliance and partnership development—Continue to work with partners and other land managers in planning and implementation of ecosystem-level restoration and management to benefit this species.

## References:

- [HFNWR] Hakalau Forest National Wildlife Refuge. 2024. Annual Report of Endangered Plant Propagation and Outplanting at the Big Island National Wildlife Refuge Complex of the Hakalau Forest Unit and Kona Forest Unit. Submitted by Donna Ball. Permit No. TE090350-8; Subpermit No. HFNWR-8. 17pp.
- [HPPRCC] Hawai'i and Pacific Plants Recovery Coordinating Committee. 2011. Revised recovery objective guidelines. 8 pp.
- [HVNP] 2024. Annual report to the U.S. Fish and Wildlife Service threatened and endangered plants Hawaii Volcanoes National Park ES019078. 39 pp.
- Lyon Arboretum. 2024. 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.
- [NTBG] National Tropical Botanical Garden. 2025. 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] 2024. Plant Extinction Prevention Program FY 2023 annual report Oct 1, 2023-Sep 30, 2024), USFWS CFDA Program #15.657, Endangered Species Conservation-Recovery Implementation Funds, Coop Agreement F14AC00174, December 24, 2016, UH Mānoa, PCSU, PEPP. 56 pp.
- [USFWS] U.S. Fish and Wildlife Service. 1996. Recovery plan for the Big Island Plant Species. Portland. 176 pp. + appendices.
- [USFWS] 2012. *Cyrtandra tintinnabula* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. [https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public\\_docs/species\\_nonpublish/1987.pdf](https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/1987.pdf).
- [USFWS] 2020. *Cyrtandra tintinnabula* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. [https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public\\_docs/species\\_nonpublish/3150.pdf](https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/3150.pdf).
- [USFWS] 2023. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status reviews for 133 Species in Oregon, Washington, Idaho, Montana, California, Hawaii, Guam, and the Northern Mariana Islands. Federal Register 88(56): 17611–17614, March 23, 2023.

[VRPF] Volcano Rare Plant Facility. 2024. 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.

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SIGNATURE PAGE for 5-YEAR REVIEW of *Cyrtandra tintinnabula* (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**

\_\_\_\_\_ Date \_\_\_\_\_