

5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Clermontia lindseyana* (‘ōhā wai)

Current Classification: Endangered

Federal Register Notice announcing initiation of this review:

[USFWS] U.S. Fish and Wildlife Service. 2023a. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status reviews for 133 Species in Oregon, Washington, Idaho, Montana, California, Nevada, Hawaii, Guam, and the Commonwealth of 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:

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 2024. The review was based on a review of current, available information since the last 5-year review for *Clermontia lindseyana* (USFWS 2020). 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/5493>).

Review Analysis:

Please refer to the previous 5-year reviews for *Clermontia lindseyana* published in the Federal Register on August 27, 2010, August 3, 2015 and September 25, 2020 (available at https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/1641.pdf, https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/2273.pdf, and https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/3105.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. lindseyana*.

This perennial shrub or tree in the Campanulaceae (bellflower) family is endangered and is known from the islands of Maui and Hawai‘i. The status and trends for *Clermontia lindseyana* are provided in the tables below.

New Status Information:

- *Clermontia lindseyana* occurs on east Maui (Haleakalā) and on the island of Hawai‘i. Currently on Maui, there are fewer than 30 wild individuals within a fenced area in Na Kula Natural Area Reserve, on the south slope of Haleakalā (Plant Extinction Prevention Program [PEPP] 2019–2024).
- Currently, on the island of Hawai‘i, there are a number of scattered, very small populations of wild individuals at Hakalau Forest National Wildlife Refuge (NWR) (13) Pi‘ihonua South (4 mature, 4 immature), Waiākea Upper (1), Kūlani (18), Kapāpala Lower (1), Kipāhoehoe (1), ‘Ōlelomoana (1), and Kukuiopa‘e (1). Reintroduced populations are at Pi‘ihonua South (7), Kahuku East (ca 250 added after 2019), Kīpukanēnē (31), Kipāhoehoe (68), Honokua (Waiea Natural Area Reserve [NAR]) (12), and Hakalau Forest NWR (more than 10,000 between 1999 and 2021) (PEPP 2019–2024; Hawai‘i Volcanoes National Park [HAVO] 2024a; Hess et al. 2013, p. 2; USFWS 2015, p. 2; USFWS 2020b, p. 7; USFWS 2023b, pp 75–76).
- There are at least 21 wild plants from 8 populations represented from Hawai‘i island in *ex situ* storage and/or propagation.

New Threats:

- None reported.

New Management Actions:

- Monitoring—Wild and reintroduced populations are monitored by the Plant Extinction Prevention Program (PEPP). PEPP assigned the status of “Rare on Island” (ROI) to *Clermontia lindseyana* on the island of Hawai‘i (PEPP 2021, p. 26). Because of this status, PEPP will survey for, monitor, and collect from occurrences of this species (PEPP 2021, p. 26; PEPP 2022, p. 27).
- Land acquisition—In 2020, the State’s Natural Area Reserves Commission proposed the creation of Waiea Natural Area Reserve (NAR) in the South Kona area of the island of Hawai‘i (NARS–Department of Land and Natural Resources [DLNR] 2020). The Division of Forestry and Wildlife (DOFAW) reviewed the proposal and recommended NAR designation (DOFAW 2022). The Waiea NAR was then established in July of 2022 (NARS 2022). Many native plants and birds are associated with this site which is near historic habitat for *Clermontia lindseyana* and will be used as a translocation site for this species.
- Ungulate control—The State is soliciting bids for fence construction for Waiea NAR (State of Hawai‘i 2025).
- Captive propagation for genetic storage and reintroduction—

- In 2024 the Lyon Arboretum Seed Conservation Laboratory reported storage of a 2007 collection of 503 seeds from one founder at Keauhou-Kilauea Upper (Lyon Arboretum 2024).
- In 2020, Hakalau Forest NWR reported propagation of 145 individuals at the greenhouse (USFWS 2020b, p. 9). In 2021, there were two plants in storage, in 2022, 118 plants were propagated for the State Native Ecosystems Protection and Management program, with an additional 27 plants for greenhouse storage, and in 2024 there were 19 plants in the greenhouse (USFWS 2021, p. 9; USFWS 2022, p. 8; USFWS 2024, p. 12).
- In 2024, the Volcano Rare Plant Facility (VRPF) reported propagation and storage of four plants representing two founders at Ka‘ū, 42 plants representing two founders at Kipāhoehoe, 33 plants representing four founders at Kūlani, and two plants representing two founders at Hilo Forest Reserve (VRPF 2024).
- In 2021, Hawai‘i Volcanoes National Park (HAVO) reported collection of nine cuttings from five founders and more than 8,000 seeds from two founders at Kahuku (HAVO 2021, p. 13). In 2022, six fruit were collected from one founder at Kahuku (HAVO 2022, pp. 4, 15). In 2024, one fruit was collected from Kahuku Mauka (HAVO 2024a, p. 4). The 2024 summary report for collections from multiple founders at Kahuku East was 17,708 seeds (HAVO 2024b).
- The National Tropical Botanical Garden (NTBG) reported storage of 287 seeds collected from an unspecified source in 1991 (NTBG 2025). Due to its age the viability of this collection is uncertain.
- Reintroduction and translocation—
 - In 2020, HAVO reported that 31 of 34 outplants at the fenced CCC site were surviving but by 2021, only 10 remained (HAVO 2021 pp. 13–14). In 2022, an additional seven plants were added to the CCC site (HAVO 2022, pp. 8, 15). In 2023, six plants were added to the site (HAVO 2023, pp. 5, 11). In 2024, 15 outplants were recorded at Kahuku, with seven surviving (HAVO 2024a, p. 11).
 - In 2021, Hakalau Forest NWR reported 138 individuals were outplanted at the Refuge (USFWS 2021, p. 9).
 - In 2024, VRPF reported propagation of six plants representing two founders at Ka‘u sent out to Ka‘ū; 15 plants representing two founders at Kipāhoehoe sent out to Waiea NAR; 18 plants representing four founders at Kūlani sent out to Kūlani, and 21 plants representing three founders at Hilo Forest Reserve sent out to Kūlani (VRPF 2024).
 - In 2024, PEPP reintroduced 12 individuals to a small, fenced area in the Waiea NAR (PEPP 2024, p. 9; PEPP 2019–2024).
 - In 2023, Haleakalā National Park (HALE) reported reintroduction of nine individuals (HALE 2023, p. 3).
 - Research on pollination ecology—Research on pollination ecology discovered that two honeycreeper species, ‘i‘iwi and the Hawai‘i ‘amakihi, were infrequent or occasional floral visitors to *C. lindseyana* at the Hakalau Forest NWR (Pender 2013, p. 109 in USFWS 2023b, p. 76).

Table 1. Status and trends of *Clermontia lindseyana* from listing through current 5-year review. Table 1a shows progress according to Downlisting Criteria Goals; Table 1b show progress according to Preventing Extinction Goals.

Table 1a.

Date	No. wild individuals	No. Outplanted	Downlisting Criteria Identified in Recovery Plan	Downlisting Criteria Completed?
1994 (listing)	225–325	0	All threats managed in all 5–7 populations	No
			Complete genetic storage	No
			5–7 populations with 300 mature individuals each	No
2010 (5-year review)	400–500	>500	All threats managed in all 5–7 populations	No
			Complete genetic storage	Partially
			5–7 populations with 300 mature individuals each	No
2015 (5-year review)	~94, likely due to unknown status of 4 populations (Hawai‘i) ca 30 (Maui)	~2,093	All threats managed in all 5–7 populations	Partially
			Complete genetic storage	Partially
			5–7 populations with 300 mature individuals each	No

Table 1b.

Date	No. wild individuals	No. outplanted	Preventing Extinction Criteria Identified by HPPRCC*	Preventing Extinction Criteria* Completed?
2020 (5-year review)	<50 (Hawai'i) ca 30 (Maui)	>2,250	All threats managed in all 3 populations	Partially, 5 fenced areas
			Complete genetic storage	Partially
			Reproduction (i.e., viable seeds, seedlings) at all 3 populations	Partially, recruitment observed at Kahuku
			3 populations with 50 mature individuals each	No (excluding outplants)
2025 (5-year review)	ca 41 (Hawai'i) <30 (Maui)	currently 368; + >10,000 at Hakalau NWR 1999–2021	All threats managed in all 3 populations	Partially, almost all wild individuals fenced
			Complete genetic storage	Partial
			Natural reproduction at all 3 populations	Partially, recruitment observed at Kahuku
			3 populations with 50 mature individuals each	No (still monitoring translocation success)

*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 *Clermontia lindseyana* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Ungulate degradation of habitat	A	Ongoing	Partial, 5 fenced areas (Hawai‘i)
Established ecosystem altering invasive plant species degradation of habitat and competition	A, E	Ongoing	None
Climate change degradation or loss of habitat	A	Ongoing	None
Rodent predation and herbivory	C	Ongoing	None
Invertebrate predation and herbivory	C	Ongoing	None
Lack of adequate hunting regulations	D	Ongoing	Partial, 5 fenced areas (Hawai‘i)
Reduced viability due to loss of mutualists	E	Ongoing	Partially, birds observed pollinating outplants at Hakalau NWR

Synthesis:

Currently, there are seven populations of *Clermontia lindseyana* totaling approximately 41 wild individuals on the island of Hawai‘i and one population on Maui totaling fewer than 30 individuals. Five wild populations on Hawai‘i and the one on Maui are provided protection from the activities of feral ungulates by fencing. Collection and storage, propagation, and translocation are ongoing with 21 founders from eight Hawai‘i populations represented. Currently, 368 individuals have been translocated; however, since 2019 thousands of plants were reintroduced, mostly to two sites (Kahuku and Hakalau Forest NWR). However, two years after reintroduction, the survival rate of some individuals is very low; and reproductive success of any second-generation plants is uncertain. Native honeycreepers have been observed visiting reintroduced plants.

Preventing extinction, interim stabilization, downlisting, and delisting objectives were provided in the Recovery Plan for the 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. 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.

Clermontia lindseyana is a short-lived perennial shrub or tree. 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 islands of Maui and Hawai‘i where the species occurs 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 *Clermontia lindseyana* have not been met. The number of wild individuals has dramatically dropped. Genetic storage collection efforts are ongoing but not complete with 21 wild plants from eight Hawai‘i populations, but none recorded for the Maui population (Table 1b). There are two large, translocated populations but their recruitment and reproductive success is uncertain at this time (Table 1b). In addition, not all threats including invasive nonnative plants, predation by ungulates, rodents, and invertebrates, and loss of mutualists, are being managed (Tables 1a, 1b, Table 2). Therefore, *C. lindseyana* 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—
 - Continue to conduct surveys especially at historical populations for a thorough assessment of this species’ status.
 - Continue to monitor wild and reintroduced populations especially regarding recruitment and success of reproduction.
- Ungulate monitoring and control—Continue to construct and maintain exclosures to protect individuals from the negative impacts of feral ungulates.
- Invasive nonnative plant monitoring and control—Control established ecosystem-altering nonnative invasive plant species and those that compete with *Clermontia lindseyana*, especially within fenced areas.
- Climate change adaptation strategy—Assess the modeled effects of climate change on this species and use to determine future landscape needed for its recovery.
- Predator and herbivore monitoring and control—Develop and implement effective control methods for slugs at populations where slug herbivory is observed. Implement effective control methods for rats at all wild and translocated populations.
- Captive propagation for genetic storage and reintroduction—
 - Continue collections and propagation efforts for maintenance of genetic stock and for reintroduction.

- Track individuals (wild and translocated) to ensure complete genetic representation of propagules for storage and reintroduction.
- Reintroduction and translocation—Continue to identify suitable reintroduction sites and establish new populations and augment wild populations on Maui and the island of Hawai‘i to increase species’ resiliency, redundancy, and representation.
- Population viability monitoring and analysis—Determine population structure, vigor, demography, and phenology to develop recovery strategies for this variety.
- Alliance and partnership development—Continue to work with the Hawaii Division of Forestry and Wildlife, Hawaii Volcanoes National Park, and other partners and land managers in planning and implementation of ecosystem-level restoration and management to benefit this species.

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U.S. FISH AND WILDLIFE SERVICE
SIGNATURE PAGE for 5-YEAR REVIEW of *Clermontia lindseyana*
(‘ōhā wai)

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 _____