5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Clermontia pyrularia* (ʻōhā 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, Hawaiʻi

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 pyrularia* (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/6165*).

Review Analysis:

Please refer to the previous 5-year reviews for *Clermontia pyrularia* published in the Federal Register on August 2, 2007, and March 2, 2020 (available at *https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/1094.pdf*, and *https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/2946.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. pyrularia*.

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

New Status Information:

- In 1990 there were 14 wild individuals at Pihā (Plant Extinction Prevention Program [PEPP] 2019–2024). Between 2014 and 2016, there was one wild individual each at Kālepa, Pihā, and Kanakaleonui (PEPP 2019–2024). The last known wild plant at Pihā was extirpated in 2015 until two new plants were observed in 2025 (J. VanDeMark pers. comm. March 2025).
- Three founders are currently represented in *ex situ* storage.

New Threats:

- None reported.

New Management Actions:

- Monitoring—Wild and reintroduced populations are monitored by the Hakalau Forest NWR and by PEPP (USFWS-Hakalau Forest NWR 2020, p. 7, 2021, p. 7, 2022, p. 6; PEPP 2020, p. 13, 2024, p. 16).
- Ungulate control—Populations at Kalepa, Laupāhoehoe, and Pihā are within exclosures (PEPP 2019–2024; PEPP 2020, p. 13). Hakalau Forest NWR also manages feral ungulates.
- Captive propagation for genetic storage and reintroduction—
    - The Lyon Arboretum Seed Conservation Laboratory reported storage of nearly 11,000 seeds representing three founders at Kālepa, Pihā, and Hakalau NWR (Lyon Arboretum 2024). In 2024, the Lyon Arboretum Micropropagation Laboratory reported propagation of 14 explants representing one founder at Pihā (Lyon Arboretum 2024).
    - In 2020, Hakalau Forest NWR reported propagation of six individuals at the greenhouse with an inventory of only one plant remaining in 2021 and 2022, and two plants in 2024 (USFWS-Hakalau Forest NWR 2021, p. 10; 2022, p. 10; 2024, p. 12).
    - In 2023, the Volcano Rare Plant Facility (VRPF) reported propagation of 31 plants representing one founder at Laupāhoehoe for translocation to Kanakaleonui (Hawai‘i Department of Land & Natural Resources–Division of Forestry and Wildlife [DLNR–DOFAW] 2023, p. 67). There are currently no founders represented at this facility (VRPF 2024).
- Reintroduction and translocation—
    - In 2020, Hakalau Forest NWR reported 35 individuals were outplanted at the Refuge, with an addition of four individuals in 2021 (USFWS-Hakalau Forest NWR 2020, p. 9; 2021, p. 9). It was observed that plants translocated to a site within the NWR at Maulua were more successful than those within Pua ‘Ākala, likely due to substrate differences (USFWS-Hakalau Forest NWR 2022, p. 6).
    - In 2023, VRPF reported translocation of 85 individuals (DLNR–DOFAW 2023, p. 67).

- In 2022, PEPP reintroduced 26 individuals (DLNR–DOFAW 2022, p. 3). The outplanting area at Laupāhoehoe has a 76 to 100 percent success rate, with 522 individuals representing seven of the nine wild founder lines (PEPP 2020, p. 13).

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

Table 1a.

Date	No. wild individuals	No. Outplanted	Stability Criteria Identified in Recovery Plan	Stability Criteria Completed?
1994 (listing)	>5	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2007 (5-year review)	15	569, 136 survive	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 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)	2	>400; 1999-2021 >6,000 at Hakalau Forest NWR	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially, complete for 2 populations
			Reproduction (i.e., viable seeds, seedlings) at all 3 populations	No
			3 populations with 50 mature individuals each	Partially, 2 reintroduced populations >50 mature individuals; no recruitment observed
2025 (5-year review)	2	26 translocated; hundreds persist	All threats managed in all 3 populations	Partially, some fencing and invasive plant management
			Complete genetic storage	Partial
			Natural reproduction at all 3 populations	None reported
			3 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 stage after Preventing Extinction).

Table 2. Threats to *Clermontia pyrularia* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Ungulate degradation of habitat	A	Ongoing	Partial, 3 translocated populations fenced; must monitor for ungulate ingress
Established ecosystem altering invasive plant species degradation of habitat and competition	A, E	Ongoing	Partial, invasive nonnative plant control within exclosures
Climate change degradation or loss of habitat	A	Ongoing	None
Ungulate predation and herbivory	C	Ongoing	Partial, 3 translocated populations fenced; must monitor for ungulate ingress
Rodent predation and herbivory	C	Ongoing	None
Reduced viability due to low numbers	E	Ongoing	Partially, seed storage, propagation, and translocation efforts ongoing

Synthesis:
In 2020, there were three wild individuals of *Clermontia pyrularia* on the island of Hawaii. Currently, two wild individuals remain. Three populations are provided protection from the activities of feral ungulates by fencing. Collection and storage, propagation, and translocation are ongoing with at least three founders represented. Thousands of individuals have been planted to establish translocated populations; however, recruitment and reproductive success of any second-generation plants has not been reported. Naturally-recruited individuals contribute toward preventing extinction and recovery goals at translocated populations.

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 pyrularia 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 island of Hawai‘i where the species occurs 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 *Clermontia pyrularia* have not been met. There are only two remaining wild individuals and no reported naturally-recruiting individuals at translocated populations. There is good genetic representation of three founders, but not of the extant two individuals (Table 1b). In addition, threats, including habitat degradation and competition by invasive nonnative plants and predation by ungulates and rodents, are not being managed (Tables 1a, 1b, Table 2). Therefore, *C. pyrularia* 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—Continue control of established ecosystem-altering nonnative invasive plant species and those that compete with *Clermontia pyrularia*, 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.
- Rodent monitoring and control—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.
- Reintroduction and translocation—Continue to reintroduce individuals into suitable habitat within historic range that is being managed for known threats to increase species' resiliency, redundancy, and representation.
- Population viability monitoring and analysis—Continue to study *C. pyrularia* with regard to population size and structure, geographical distribution, flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, limiting factors, and threats. Test reintroduction of *C. pyrularia* into small areas at high densities intermixed with common native food plants for birds, as suggested in the annual permit reports for endangered

plant propagation and outplanting activities at Hakalau Forest NWR (Jeffrey and Horiuchi 2005; Kendall and Horiuchi 2013).

- Alliance and partnership development—Continue to work with the Hawai‘i Division of Forestry and Wildlife and Hakalau Forest NWR, and other partners and land managers in planning and implementation of ecosystem-level restoration and management to benefit this species.

References:

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

[HDLNR-DOFAW] Hawai‘i Department of Land & Natural Resources-Division of Forestry and Wildlife. 2022. Plant restoration and enhancement: threatened and endangered, candidate, and species of concern outplanting. 8 pp.

[HDLNR-DOFAW] 2023. Grant number: F21AP00243, Statewide Endangered Plant Program, INTERIM Performance Report. Submitted March 2023. 132 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.

[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] 2024. University of Hawai‘i at Mānoa, Pacific Cooperative Studies Unit. Plant Extinction Prevention Program Fiscal Year 2024 Interim Performance Report (October 1, 2023-September 30, 2024), Cooperative Agreements F19AC00532, F22AC02205, F23AC01766. 56 pp.

[PEPP] 2019–2024. Plant Extinction Prevention Program fiscal years 2019 to 2024 interim performance report (October 1, 2018-September 30, 2024). 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. + tables.

[USFWS] U.S. Fish and Wildlife Service. 2007. *Clermontia pyrularia* (‘ōhā wai) 5-year review summary and evaluation. Pacific Islands Fish and Wildlife Office,

Honolulu. 7 pp. *https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/1094.pdf.*

[USFWS] 2020. *Clermontia pyrularia* (ʻōhā wai) 5-year review summary and evaluation. Pacific Islands Fish and Wildlife Office, Honolulu. 9 pp. *https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/2946.pdf*)

[USFWS] 2023. 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.

USFWS-Hakalau Forest NWR 2020. Annual report CY2020 endangered plant propagation and out-planting; nēnē monitoring and forest bird banding at Hakalau Forest National Wildlife Refuge. USFWS Regional Blanket Permit No. TE090350-8, Subpermit No. HFNWR-8, D. Ball and B. Horiuchi, Hilo, HI. 12 pp.

USFWS-Hakalau Forest NWR 2021. Annual report CY2021 endangered plant propagation and out-planting; nēnē monitoring and forest bird banding at Hakalau Forest National Wildlife Refuge. USFWS Regional Blanket Permit No. TE090350-8, Subpermit No. HFNWR-8, D. Ball, Hilo, HI. 12 pp.

USFWS-Hakalau Forest NWR 2022. Annual report CY2022 endangered plant propagation and out-planting; nēnē monitoring and forest bird banding at Hakalau Forest National Wildlife Refuge. USFWS Regional Blanket Permit No. TE090350-8, Subpermit No. HFNWR-8, D. Ball, Hilo, HI. 13 pp.

USFWS-Hakalau Forest NWR 2023. Environmental assessment (draft) for the Hakalau Forest National Wildlife Refuge, 2021 Station master plan, final planning document, December 2023. 153 pp.

USFWS-Hakalau Forest NWR 2024. Annual report CY2024 endangered plant propagation and out-planting; nēnē monitoring and forest bird banding, and arthropod surveys at the Big Island National Wildlife Refuge Complex of the Hakalau Forest Unit and Kona Forest Unit. USFWS Regional Blanket Permit No. TE090350-8, Subpermit No. HFNWR-8, D. Ball, Deputy Refuge Manager, USFWS, Hilo, HI. 17 pp.

[VRPF]. 2024. Volcano Rare Plant Facility. 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, Hawaiʻi.

U.S. FISH AND WILDLIFE SERVICE
SIGNATURE PAGE for 5-YEAR REVIEW of *Clermontia pyrularia*
(ʻōhā 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
__X__ No Change in listing status

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

MEGAN LAUT Digitally signed by MEGAN LAUT
Date: 2025.07.08 12:52:24 -10'00'

_____ Date_____