5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Clermontia peleana* (ʻōhā wai)

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, 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 peleana* (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/849*).

Review Analysis:

Please refer to the previous 5-year reviews for *Clermontia peleana* published in the Federal Register on January 18, 2008, July 21, 2015 and September 25, 2020 (available at *https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/1144.pdf, https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/2260.pdf,* and *https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/3106.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. peleana*.

This short-lived perennial, sometimes epiphytic, shrub or tree in the Campanulaceae (bellflower) family is endangered. There are two subspecies: *C. peleana* subsp. *peleana* (extant on the island of Hawai‘i) and *C. peleana* subsp. *singuliflora* (extant on the island of Hawai‘i and extirpated from east Maui [Haleakalā]). The status and trends for *Clermontia peleana* are provided in the tables below.

New Status Information:

- *Clermontia peleana* subsp. *peleana*

In 2015, five wild plants remained at Hilo Forest Reserve on the island of Hawai‘i (USFWS 2015, p. 2). Currently, there are three wild plants at Pi‘ihonua North (Plant Extinction Prevention Program [PEPP] 2019–2024). Two new wild plants were discovered at the Volcano Transfer Station and at Waiākea Upper in 2021 (PEPP 2019–2024; Hawaiian Silversword Foundation [HSF] 2020, 2 pp., Hawai‘i Department of Land and Natural Resources-Division of Forestry and Wildlife [HDLNR-DOFAW] 2023, p. 4).

- *Clermontia peleana* subsp. *singuliflora*

This subspecies was last observed in 1920 on Haleakalā, and more than 30 individuals were rediscovered on private land on the island of Hawai‘i in 2010 (USFWS 2015, p. 2). Recently, five mature and three immature wild plants were observed at Kehena (island of Hawai‘i) in 2024 (PEPP 2019–2024).

- All extant individuals of *Clermontia peleana* subsp. *peleana* are represented in *ex situ* storage and all but one individual of *Clermontia peleana* subsp. *singuliflora* is represented.

New Threats:

- None reported.

New Management Actions:

Clermontia peleana subsp. *peleana*

- Surveys and monitoring—A new wild plant of subspecies *peleana* was discovered near the Volcano Transfer Station in 2021 and is being monitored (HSF 2020, 2 pp.; PEPP 2019–2024). PEPP monitors translocation sites and surveys for new populations (PEPP 2020, p. 12; PEPP 2021, p. 16; HDLNR-DOFAW 2023, p. 7).
- Ungulate monitoring and control—PEPP reported that translocated plants at Kūlani (Kīpuka Waiākea), Pi‘ihonua South, Nāhuku, and Kahuku East are fenced (PEPP 2019–2024).
- Rodent control—In 2022 and 2023, PEPP reported ongoing rat control at a translocated population at Waiākea Upper (PEPP 2019–2024; PEPP 2022, pp. 7, 17).
- Collections and captive propagation for genetic storage and reintroduction—
    - In 2022 to 2023, Lyon Arboretum Micropropagation laboratory reported propagation of 23 explants representing two founders at Pi‘ihonua North (Lyon Arboretum 2024). Between 2021 and 2023, the Lyon Arboretum Seed Conservation Laboratory reported storage of 132,465 seeds representing five

founders from two populations of translocated plants at Piʻihonua North (Lyon Arboretum 2024).
    - PEPP reported seed collections from wild plants at Piʻihonua North, Waiākea Upper, and Puʻu Makaʻala in 2021 and 2023 (PEPP 2019–2024; HDLNR-DOFAW 2023, p. 4). Collections were also made from translocated plants at Piʻihonua South, Puʻu Makaʻala-Olaʻa, and Waiākea Upper from 2021 to 2023 (PEPP 2019–2024).
    - In 2021, Hawaiʻi Volcanoes National Park (HAVO) reported collection and deposition (to HAVO) of five cuttings (from reintroduced plants at Kahuku East) and 2,385 seeds (from reintroduced plants at Nāhuku) representing eight founders (HAVO 2021, p. 4). In 2022, HAVO collected nine fruit representing six reintroduced founders at Nāhuku (HAVO 2022, p. 4). Monitoring of plants reintroduced in 2020 showed a 92 percent survival rate. In 2023, HAVO collected 11 fruit from one reintroduced founder at Nāhuku (HAVO 2023, p. 4). In 2024, HAVO collected and stored 22 fruit representing six founders at Kilauea-Nāhuku (HAVO 2024, p. 4).
    - Between 2021 and 2024, the Volcano Rare Plant Facility [VRPF] reported seed collection and propagation of plants sourced from translocated plants at Waiākea Upper (34 founders total): 12 plants in refugia representing six founders; 143,722 seeds representing 10 founders; and 42 plants in inventory to be sent out to Kūlani, HAVO, or an undetermined site, representing 16 founders (VRPF 2025).
    - The Hawaiian Silversword Foundation (HSF) collected 11 fruit from the three remaining wild founders at Wailuku stream (HSF 2020, 2 pp.). In addition, seven fruit were collected from the newly discovered wild plant on the island of Hawaiʻi and were sent to the (VRPF) for propagation (HSF 2021, 2 pp.). By the fall of 2022, more than 900 seedlings were produced from six maternal founders represented at the plant facility, with an additional 200 seedlings produced from the recently discovered plant (HSF 2021, 2 pp.).
- Reintroduction and translocation—
    - In 2023, the HSF reported reintroduction of more than 250 seedlings representing five maternal founders to Nāhuku and 32 seedlings were reintroduced to the CCC exclosure at Kahuku East (HSF 2023, 2 pp.). In 2024, 11 seedlings were translocated to a fenced area at Kūlani (PEPP 2019–2024).
    - In 2020, HAVO reported that 228 seedlings were reintroduced to Thurston Special Ecological Area (Nāhuku, as reported by the Hawaiian Silversword Foundation, above) (HAVO 2020 p. 6). HAVO also monitored a subset of individuals reintroduced to the CCC exclosure at Kahuku East (as reported by HSF, above). These two areas have the highest survival rates (Moynahan 2023, p. 5). Previous outplantings in these areas are flowering and reproducing successfully (75 to 88 percent) two to eight years post-planting (HAVO 2020, p. 11). In 2023, HAVO reintroduced 34 plants representing five founders to Kahuku Mauka, 150 plants representing the same five founders to Kilauea Mauka, and 100 plants representing the same five founders to Kilauea-Nāhuku (HAVO 2023, p. 5).

- In 2022, DLNR-DOFAW's Statewide Endangered Plant Program reported translocation of 68 individuals to a protected Forest Reserve on the island of Hawai‘i (Hawai‘i Statewide Endangered Plant Program 2022, 8 pp). In addition, since the last 5-year review, translocations occurred at Kūlani (Kīpuka Waiākea) (11 individuals), Pi‘ihonua South (19), Pu‘u Maka‘ala (940 total), Keauhou-Kilauea Lower (1,857), and at two sites at Waiākea Upper (1, 3) (PEPP 2019–2024; PEPP 2021, p. 11; PEPP 2024, p. 9).
- Plant biology and breeding program—The HSF established a managed breeding program beginning in 2010 with plants derived from air-laying of founder plants growing near Wailuku stream (HSF 2020, p. 1). In 2021, the managed plants representing four founders flowered profusely, and were hand-pollinated (HSF 2020, p. 1). Pollen was mixed across founders and produced 66 fruit. Thirty-five fruit were sent to the Lyon Arboretum Seed Conservation Laboratory for long-term storage.

Clermontia peleana subsp. *singuliflora*

- Surveys and monitoring—In 2023 and 2024, PEPP monitored both wild and translocated populations at Kehena and Kawaihae Mauka (PEPP 2019–2024).
- Collections and captive propagation for genetic storage and reintroduction—Between 2023 and 2024, the Lyon Arboretum Seed Conservation Laboratory reported storage of 37,579 seeds representing four wild founders at Kehena (Lyon Arboretum 2024).
- Reintroduction and translocation—PEPP reported translocation of 164 immature plants to Kehena and 138 immature plants to Kawaihae Mauka (PEPP 2019–2024).

Table 1. Status and trends of *Clermontia peleana* 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)	8	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2008 (5-year review)	0	144	All threats managed in all 3 populations	Partially
			Complete genetic storage	Yes
			3 populations with 50 mature individuals each	No
2015 (5-year review)	subsp. *peleana* = 5 subsp. *singuliflora* = 7	subsp. *peleana* = 3,155 subsp. *singuliflora* = 168	All threats managed in all 3 populations	Partially
			Complete genetic storage	Yes
			3 populations with 50 mature individuals each	Yes, no regeneration observed

Table 1b.

Date	No. wild individuals	No. outplanted	Preventing Extinction Criteria Identified by HPPRCC*	Preventing Extinction Criteria* Completed?
2020 (5-year review)	subsp. *peleana* = ca 10 subsp. *singuliflora* = ca 32	subsp. *peleana* = >1,000 subsp. *singuliflora* = 302	All threats managed in all 3 populations	Partially, wild and 7 reintroduced populations fenced
			Complete genetic storage	Yes
			Reproduction (i.e., viable seeds, seedlings) at all 3 populations	No
			3 populations with 50 mature individuals each	No
2025 (5-year review)	subsp. *peleana* = 5 subsp. *singuliflora* = 5 mature, 4 immature	subsp. *peleana* = 1,590 subsp. *singuliflora* = 164	All threats managed in all 3 populations	Partially, most populations fenced
			Complete genetic storage	Almost
			Natural reproduction at all 3 populations	No, recruitment not reported
			3 populations with 50 mature individuals each	No (no recruitment at translocations)

*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 peleana* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Ungulate degradation of habitat and predation	A, C	Ongoing	Partial, 4 reintroduced populations subsp. *peleana* fenced
Established ecosystem altering invasive plant species degradation of habitat and competition	A, E	Ongoing	Partial, fenced translocation areas maintained
Climate change degradation or loss of habitat	A	Ongoing	None
Rodent predation and herbivory	C	Ongoing	Partial, rat control for 1 reintroduced population
Invertebrate predation and herbivory	C	Ongoing	None
Reduced viability due to low numbers and inbreeding effects	E	Ongoing	Partial, breeding program

Synthesis:
Currently, there are five wild individuals of *Clermontia peleana* subsp. *peleana,* and five mature and four immature wild individuals of *C. peleana* subsp. *singuliflora* on the island of Hawai‘i. The subspecies *singuliflora* has not been observed on Haleakalā (Maui) since the 1920s. Four translocated populations on Hawai‘i are provided protection from the activities of feral ungulates by fencing. Nonnative invasive plants are controlled at planting sites. Seed collection and storage, propagation, and translocation are ongoing for both subspecies, with almost all wild founders represented. Currently, 1,590 individuals of subsp. *peleana* and more than 160 individuals of subsp. *singuliflora* have been translocated as reported since the last five-year review; however, there is no natural reproduction observed. Hand-pollination and air-layering techniques are used to improve genetic representation and propagation success. State, Federal and private partnerships work in coordination to provide conservation benefits for *C. peleana*.

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 peleana is a short-lived perennial, sometimes epiphytic, 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 peleana* have not been met. Although there have been thousands of individuals of subsp. *peleana*, and hundreds of individuals of subsp. *singuliflora* translocated, recruitment has yet to occur at any translocation site. Until translocated plants are able to produce a new generation, they are not considered part of the total population size. There are no wild populations totaling at least 50 mature, reproducing individuals. And while genetic storage goals are almost complete for both subspecies (Table 1), not all threats are being managed including no invertebrate control, and only partial nonnative invasive plant and rat control (Table 1a, Table 1b, Table 2). Therefore, *C. peleana* 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 in suitable habitat and in historical ranges of both subspecies, including subspecies *singuliflora* on Maui, for a thorough assessment of their status.
  - Continue to monitor wild and reintroduced populations especially in regard to 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 to control established ecosystem-altering nonnative invasive plant species and those that compete with both subspecies.
- 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 rodents at all wild and translocated populations.
- Captive propagation for genetic storage and reintroduction—Continue collection and propagation efforts for maintenance of genetic stock and for reintroduction.

- Reintroduction and translocation—Continue to identify suitable reintroduction sites and establish new populations and augment wild populations to increase both subspecies' resiliency, redundancy, and representation.
- Population viability monitoring and analysis—
  - Continue controlled breeding program for both subspecies maintaining records of maternal lines.
  - Investigate techniques to improve natural recruitment.
- Alliance and partnership development—Continue to work with partners and land managers in planning and implementation of ecosystem-level restoration and management to benefit these subspecies.

References:

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

HDLNR-DOFAW] Hawaii Department of Land and Natural Resources-Division of Forestry and Wildlife. 2023. Statewide Endangered Plant Program, Interim Performance Report, grant number F21AP00243, submitted March 2023. 132 pp.

[HSF] Hawaiian Silversword Foundation. 2020. Year 1 annual performance report, grant no. F20AC11233-00. 2 pp.

[HSF] 2021. Year 2 annual performance report, grant no. F20AC11233-00. 2 pp.

Hawaii State Endangered Plant Program. 2022. Plant restoration and enhancement: threatened, endangered, candidate and species of concern outplanting. L. Perry, F19AF00785, January 1, 2022 to December 31, 2022. 8 pp.

[HAVO] Hawai‘i Volcanoes National Park. 2020. Annual report to the U.S. Fish and Wildlife Service threatened and endangered plants. Hawai‘i Volcanoes National Park TE-018078-21. 31 pp.

[HAVO] 2021. Annual report to the U.S. Fish and Wildlife Service threatened and endangered plants. Hawai‘i Volcanoes National Park TE 018078-21, 2021. 36 pp.

[HAVO] 2022. Annual report to the U.S. Fish and Wildlife Service threatened and endangered plants, ES018078 2022. 38 pp.

[HAVO] 2023. Annual report to the U.S. Fish and Wildlife Service threatened and endangered plants. Hawai‘i Volcanoes National Park TE 018078-21, 2023. 36 pp.

[HAVO] 2024. Annual report to the U.S. Fish and Wildlife Service threatened and endangered plants. Hawai‘i Volcanoes National Park TE 018078-21, 2024. 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.

Moynahan, B. 2023, NPS, National Park Service comments on 88 FR 17611, initiation of 5-year status reviews. 15 pp.

[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] Plant Extinction Prevention Program. 2021. Plant Extinction Prevention Program fiscal year 2021 interim performance report (October 1, 2020-September 30, 2021), Cooperative Agreement 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. 46 pp.

[PEPP] 2022. Plant Extinction Prevention Program fiscal year 2022 interim performance report (October 1, 2021-September 30, 2022), Cooperative Agreement 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. 50 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. 2008. *Clermontia peleana* (‘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/1144.pdf.*

[USFWS] 2015. *Clermontia peleana* (ʻōhā wai) 5-year review summary and evaluation. Pacific Islands Fish and Wildlife Office, Honolulu. *https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/2260.pdf.*

[USFWS] 2020. *Clermontia peleana* (ʻōhā wai) 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. 8 pp. *https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/3106.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.

[VRPF] Volcano Rare Plant Facility. 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, Hawaiʻi.

U.S. FISH AND WILDLIFE SERVICE
SIGNATURE PAGE for 5-YEAR REVIEW of *Clermontia peleana*
(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 12:45:32 -10'00'

_____ Date_____