5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Dracaena fernaldii* (hala pepe)

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, 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 *Pleomele hawaiiensis* (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 (*http://ecos.fws.gov/ecp/species/6285*).

Review Analysis:

Please refer to the previous 5-year review for *Pleomele fernaldii* published in the Federal Register on August 26, 2020 (available at *https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/3056.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 *P. fernaldii.*

This long-lived perennial tree in the Asparagaceae (asparagus) family is endangered and found on the island of Lāna‘i. The status and trends for *Dracaena fernaldii* are provided in the tables below.

New Status Information:

- At the time of the previous 5-year review in 2020, there were estimated to be several hundred to 1,000 total wild individuals in two population units across Lānaʻi, Lōpā Waiʻopa-Haua and Kapōhaku-Kaunoa-Hoʻokiʻo. While all wild populations have not been monitored since that time, five sites within the two populations were monitored in 2020, and approximately 110 mature individuals and eight immature individuals were observed (Plant Extinction Prevention Program [PEPP] 2024). Approximately half the plants observed were healthy and half were observed to have moderate vigor (PEPP 2024). There has been no reported monitoring of wild populations since, and the total population is estimated between 110 and 1,000 individuals (Pūlama Lānaʻi 2021; PEPP 2024).
- Currently, there are three founder lines represented in *ex situ* storage and propagation collections, including plants in a nursery or living collection (Pūlama Lānaʻi 2021; Lyon Arboretum 2024).
- When listed in 2013, this species was classified as a member of the Agavaceae (agave) family. Since that time, placement of *Pleomele fernaldii* was formally moved into the Asparagaceae (asparagus) family, recognized in the Service's technical correction of 2015 (80 FR 35860, June 23, 2015). Phylogenetic analysis of chloroplast DNA, as well as differences in floral morphology and diurnal flowering pattern, indicate that Hawaiian *Pleomele* species are a distinct group. This group has been alternatively treated as the genus *Chrysodracon*, but based on genetic analyses, *Chrysodracon* is now considered a subgenus nested within the genus *Dracaena*. Thus, the scientific name of *Pleomele fernaldii* is updated in the 50 CFR Part 17 to *Dracaena fernaldii*, recognized in the Service's technical correction of 2023b (88 FR 7134–7177, February 2, 2023). This taxonomic revision does not affect the range or endangered status of the species.

New Threats:

- None

New Management Actions:

- Monitoring and surveys—PEPP and staff at Pūlama Lānaʻi monitor wild and reintroduced populations of *Dracaena fernaldii* plants, as well as monitor and maintain fences protecting wild and reintroduced populations from ungulates (Pūlama Lānaʻi 2021; PEPP 2024).
- Staff at Pūlama Lānaʻi and PEPP control invasive plants around populations and along fence lines (Pūlama Lānaʻi 2021; PEPP 2024).
- Staff at Pūlama Lānaʻi control rats at five sites within the two population units on Lānaʻi (Pūlama Lānaʻi 2021).
- Collection and propagation for genetic storage and reintroduction—
    - Lyon Arboretum reported a collection of seeds in 2006, however, currently no seeds remain in storage (Lyon Arboretum 2024).
    - Pūlama Lānaʻi reports 243 potted plants as a living collection, representing three founder plants from Lōpā Waiʻopa-Haua (Pūlama Lānaʻi 2021).

- Translocation—A total of 19 plants were outplanted at three sites within Lōpā in 2019, however, there has been no reported monitoring of those plants since, and the current status is unknown (Pūlama Lānaʻi 2021). In 2020, 34 individuals were reintroduced at one site within Lōpā (Pūlama Lānaʻi 2021).

Table 1. Status and trends of *Dracaena fernaldii* from listing through current 5-year review.

Table 1.

Date	No. wild individuals	No. Outplanted	Preventing Extinction goals identified in Recovery Plan	Stability Goals Completed?
2013 (Listing)	Several hundred–1,000	0	All threats managed in all 3 populations	Partially
			Complete genetic storage	No
			3 populations with 25 mature individuals each	Partially
2020 (5-year review)	~1,000	19	All threats managed in all 3 populations	Partially
			Complete genetic storage	No
			3 populations with 25 mature individuals each	Partially
2025 (5-year review)	110– 1,000	34 planted (unknown number persist)	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially
			Reproduction (i.e., viable seeds, seedlings, saplings) at all 3 populations	Unknown
			3 populations with 25 mature individuals each	Partially

Table 2. Threats to *Dracaena fernaldii* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Ungulate destruction and degradation of habitat and herbivory	A	Ongoing	Partial, enclosures constructed at wild and reintroduced populations
Established ecosystem altering invasive plant species degradation of habitat	A	Ongoing	Nonnative plant control at wild and reintroduced populations
Fire	A	Ongoing	None
Stochastic events, hurricanes and treefall	A	Ongoing	None
Disease	C	Potential	None
Predation and herbivory by ungulates	C	Ongoing	Partial, enclosures constructed at wild and reintroduced populations
Predation and herbivory by rodents, rats	C	Ongoing	Partial, control at five sites
Inadequate regulatory mechanisms	D	Ongoing	None
Lack of regeneration	E	Ongoing	Partial, propagation and outplanting ongoing
Climate change	E	Ongoing	None

Synthesis:
Currently there are approximately 110–1,000 wild individuals of *Dracaena fernaldii* on the island of Lānaʻi. Individuals are provided protection from ungulates by fencing, rodent control, and nonnative plant control. Plant collections, propagation, and outplanting are ongoing.

Preventing Extinction and Interim Stabilization targets, and Downlisting and Delisting criteria are provided in the Recovery Plan for 44 Species from Maui Nui (Islands of Maui, Molokaʻi, and Lānaʻi (USFWS 2023c). 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.

Dracaena fernaldii is a long-lived perennial 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 Lānaʻi and each of these

populations must be naturally reproducing (i.e., viable seeds, seedlings) with a minimum of 25 mature, reproducing individuals per population.

The preventing extinction goals for this species have not been met (Table 1). The total population size is currently unknown, including the number of annually reproducing individuals, all threats are not being managed, and genetic storage is limited (Table 2). Therefore, *Dracaena fernaldii* 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 monitor known populations of *Dracaena fernaldii* to assess resiliency and make collections.
  - Determine suitable locations for reintroductions.
- Ungulate monitoring and control—Monitor fenced exclosures and construct new fences to protect individuals from the negative impacts of browsing by ungulates.
- Invasive nonnative plant monitoring and control—Continue to control established ecosystem-altering nonnative invasive plant species, and those that compete with *Dracaena fernaldii.*
- Species and habitat protection—Develop and implement effective control measures to reduce the impacts of destruction by fire and treefall.
- Predator and herbivore monitoring and control—Develop and implement effective control measures to reduce the impact of invasive vertebrate predation, specifically for rats.
- Fire prevention and control—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.
- 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 lack of regeneration.
- Research—
  - Conduct genetic studies to determine genetic variation within the population (and between populations) and plan an effective breeding program.
  - Research potential disease impacts to the species
- 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:

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

Pūlama Lāna‘i. 2021. 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.

[USFWS] U.S. Fish and Wildlife Service. 2020. *Pleomele fernaldii* 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/3056.pdf*.

[USFWS] 2023a. 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.

[USFWS] 2023b. Endangered and threatened wildlife and plants; technical corrections for 62 wildlife and plant species on the list of endangered and threatened wildlife and plants. 88 FR 7134–7177, February 2, 2023.

[USFWS] 2023c. Recovery plan for 44 species from Maui Nui (islands of Maui, Moloka‘i, and Lāna‘i. Portland. 90 pp. + appendices.

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SIGNATURE PAGE for 5-YEAR REVIEW of *Dracaena fernaldii* (hala pepe)

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**

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