5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Schiedea adamantis* (Diamond Head schiedea)

Current Classification: Endangered

Federal Register Notice announcing initiation of this review:

[USFWS] U.S. Fish and Wildlife Service. 2022. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status reviews for 167 Species in Oregon, Washington, Idaho, Montana, California, Hawaii, Guam, and the Northern Mariana Islands . Federal Register 87(90): 28031–28034, May 10, 2022.

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 *Schiedea adamantis* (USFWS 2019). 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/3608*).

Review Analysis:

Please refer to the previous 5-year reviews for *Schiedea adamantis* published in the Federal Register on January 18, 2008, (available at *https://ecos.fws.gov/docs/tess/species_nonpublish/1160.pdf*), on August 19, 2013, (available at *https://ecos.fws.gov/docs/tess/species_nonpublish/2095.pdf*), on September 30, 2019, (available at *https://ecos.fws.gov/docs/tess/species_nonpublish/2892.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 *S. adamantis*.

This short-lived perennial shrub in the Caryophyllaceae (carnation) family is endangered and endemic to O‘ahu. The current status and trends for *Schiedea adamantis* are provided in the tables below.

New Status Information:

- Currently there are approximately 13-19 wild individuals of *Schiedea adamantis* in two populations (Lēʻahi and Kuluʻī) in the Koʻolau mountains of Oʻahu (Ching-Harbin, Loomis, and Springer 2021; Togikawa and Thomas 2021; Togikawa and Tsuneshige 2022; and Plant Extinction Prevention Program [PEPP] 2023).
- Currently, approximately 10 founder lines are represented in *ex situ* storage, including seeds in seed banks, explants in micropropagation, and plants in a nursery or living collection (Lyon Arboretum 2023; Oʻahu Nursery 2023).

New Threats:

- None

New Management Actions:

- Monitoring and surveys— Plant Extinction Prevention Program (PEPP) monitors individuals of *Schiedea adamantis* in the Waiʻanae mountains of Oʻahu (Ching-Harbin, Loomis, and Springer 2021; Togikawa and Thomas 2021; Togikawa and Tsuneshige 2022; and PEPP 2023).
- Nonnative plant control—Nonnative plants are controlled around *Schiedea adamantis* by PEPP (PEPP 2023; Togikawa and Tsuneshige 2022).
- Collection and propagation for genetic storage and reintroduction—
    - Lyon Arboretum Micropropagation Laboratory reports 201 explants in micropropagation representing 2 founders, and Lyon Arboretum Seed Conservation Laboratory reports over 350,000 seeds in storage representing 10 wild founders and plants propagated in greenhouses (Lyon Arboretum 2023).
    - The Oʻahu Nursery reports 19 individual plants in propagation representing three founders (Oʻahu Nursery 2023).
- Reintroduction/ Augmentation/ Introduction—
    - PEPP has established reintroduction sites at approximately five locations with a total of 569 individual plants surviving. The largest single site is at Kuluʻī, with over 300 plants (PEPP 2023; Togikawa et. al. 2020; Togikawa et. al. 2023; Ching-Harbin et al. 2019).

Table 1. Status and trends of *Schiedea adamantis* from listing through current 5-year review. Table 1a shows progress according to Interim Stabilization Goals; Table 1b shows progress according to Preventing Extinction Goals.

Table 1a.

Date	No. wild individuals	No. Outplanted	Stability Goals identified in Recovery Plan	Stability Goals Completed?
1984 (Listing)	~78	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)	6	~80	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2013 (5-year review)	13-19	15	All threats managed in all 3 populations	No
			Complete genetic storage	No
			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?
2019 (5-year review)	<20	300	All threats managed in all 3 populations	Partial
			Reproduction (i.e., viable seeds, seedlings, saplings) at all 3 populations	Partial
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2024 (5-year review)	13	569	All threats managed in all 3 populations	Partial
			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 *Schiedea adamantis* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Established ecosystem altering invasive plant species degradation of habitat	A	Ongoing	Partial, some non-native plant control
Climate change degradation or loss of habitat, including hurricanes	A	Ongoing	None
Fire destruction and degradation of habitat	A	Ongoing	Partial, fire management plan in place
Drought destruction and degradation	A	Ongoing	Partial, some reintroductions on irrigation
Competition with established invasive plants	E	Ongoing	Partial, one managed area
Human disturbance—Hikers	E	Ongoing	None
Reduced viability due to low numbers	E	Ongoing	Partial, some seed collections and propagation

Synthesis:
Currently there are approximately 13-19 wild individuals of *Schiedea adamantis* on O‘ahu. Individuals are provided protection by invasive plant control. Seed collections, propagation, and outplanting are ongoing.

Stabilizing (interim), downlisting, and delisting objectives are provided in the Recovery Plan for the O‘ahu Plants (USFWS 1998) 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.

Schiedea adamantis 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 O‘ahu 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. Genetic storage is not complete (Table 1), all threats are not being managed (Table 1, Table 2), and there are no populations totaling at least 50 mature individuals. Therefore, *Schiedea adamantis* 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 2019. Thus, the following recommendations for future actions are reiterated for the 5-year review for 2024.

- Surveys and inventories—
  - Continue surveys for populations of *Schiedea adamantis* in areas of potentially suitable habitat.
  - Determine suitable locations for reintroductions.
- Invasive nonnative plant monitoring and control—Control established ecosystem-altering nonnative invasive plant species, and those that compete with *Schiedea adamantis*.
- Site and habitat protection—Develop and implement effective threat control and habitat protection measures to reduce the impact of fire, drought, and hikers.
- 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, including increasing temperatures, periods between rain events, and increasing frequency and intensity of hurricanes. Additional management actions may be needed, such as locating key microsites that overlap with current and future climate envelopes for translocation efforts.
- Captive propagation for genetic storage and reintroduction—Continue 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 climate change degradation and nonnative plant competition.
- 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.

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SIGNATURE PAGE for 5-YEAR REVIEW of *Schiedea adamantis* (Diamond Head schiedea)

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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