5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Schiedea helleri* (no common name)

Current Classification: Endangered

Federal Register Notice announcing initiation of this review:

[USFWS] U.S. Fish and Wildlife Service. 2020. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status reviews for 129 Species in Oregon, Washington, Idaho, Hawaii, Montana, California, and Nevada. Federal Register 85(48): 14240–14243, March 11, 2020.

Lead Region/Field Office:

Interior Region 12/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, Conservation & Restoration Team 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 2021. The review was based on a review of current, available information since the last 5-year review for *Schiedea helleri* (USFWS 2017). The evaluation by Daniel Adamski, Biologist, was reviewed by Lauren Weisenberger, Plant Recovery Coordinator, and Megan Laut, Conservation and Restoration Team 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 (*https://ecos.fws.gov/ecp/species/7101*).

Review Analysis:

Please refer to the previous 5-year reviews for *Schiedea helleri* published in the Federal Register on August 27, 2010 (available at *https://ecos.fws.gov/docs/tess/species_nonpublish/1652.pdf*) and September 18, 2017 (available at *https://ecos.fws.gov/docs/tess/species_nonpublish/2505.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 *Schiedea helleri*.

This short-lived perennial vine in the Caryophyllaceae (pink) family is endangered and is known from the island of Kaua‘i. The status and trends for *Schiedea helleri* are provided in the tables below.

New Status Information:

- Currently, *Schiedea helleri* is known from three populations at Mōhihi on Kauaʻi totaling 18 individual plants (Plant Extinction Prevention Program [PEPP] 2021). A fourth population with one individual was observed at Nāwaimaka in 2018, however, recent surveys revealed no plants remaining at the population (Kishida et. al. 2018, PEPP 2021).

New Threats:

- None.

New Management Actions:

- Collection and propagation for genetic storage and reintroduction—
  - National Tropical Botanical Garden (NTBG) reported 2 individuals in propagation representing 2 founders and over 2,400 seeds in storage representing 9 to 15 founders from Mōhihi (NTBG 2021).
  - Lyon Arboretum reports over 4,400 seeds in storage representing 18 founders from Mōhihi and one founder from Nāwaimaka (Lyon Arboretum 2022).
- Reintroduction and translocation—
  - PEPP reintroduced an additional 30 individual plants at one site at Mōhihi in 2017, increasing the population total to 81 plants (Williams 2017a, 2017b). However, recent monitoring in 2021 reported that all plants in the population were either dead or in poor condition, and only 4 individuals remain (PEPP 2021).

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

Date	No. wild individuals	No. outplanted	Stability Criteria identified in Recovery Plan	Stability Criteria Completed?
1996 (listing)	30-40	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
1998 (recovery plan)	43-53	0	All threats managed in all 3 populations	No
			Complete genetic storage	No

			3 populations with 50 mature individuals each	No
2003 (critical habitat)	50-60	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2010 (5-year review)	85-101	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
Date	**No. wild individuals**	**No. outplanted**	***Preventing Extinction Criteria identified by HPPRCC**	***Preventing Extinction Criteria Completed?**
2017 (5-year review)	40	18	All threats managed in all 3 populations	No
			Reproduction (i.e., viable seeds, seedlings, saplings) at all three populations	Unknown
			Complete genetic storage	Partial
			3 populations with 50 mature individuals each	No
2022 (5-year review)	18	30 new plants planted; 4 total currently remain	All threats managed in all three populations	No
			Complete genetic storage	Nearly Complete
			Natural reproduction at all three populations	Unknown
			Three 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 helleri* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Degradation and destruction of habitat by feral ungulates	A	Ongoing	None
Established ecosystem altering invasive plant species degradation of habitat	A	Ongoing	None
Climate change degradation or loss of habitat, including hurricanes	A	Ongoing	None
Predation and herbivory by slugs	A	Ongoing	None
Predation and herbivory by ungulates	A	Ongoing	None
Human disturbance-hiking and trail maintenance impacts	E	Ongoing	None
Invasive species—Hybridization impacts	E	Ongoing	None
Reduced viability due to low numbers	E	Ongoing	None
Tsunami mortality and reduced viability	E	Ongoing	None

Synthesis:
Currently, there are approximately 18 wild individuals of *Schiedea helleri* on Kaua‘i. Seed collection, propagation, and outplanting are ongoing.

Stabilizing (interim), downlisting, and delisting objectives are provided in the Kaua‘i Islandwide Recovery Plan (USFWS 2021) 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 helleri is a short-lived perennial vine. 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 Kaua‘i 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. While genetic storage goals have been nearly met (Table 1), there are only 18 total known wild individuals, 4 recently outplanted individuals, and all threats are not being managed (Table 1, Table 2). Therefore, *Schiedea helleri* 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 2017. Thus, the following recommendations for future actions are reiterated or updated for the 5-year review for 2022.

- Surveys and inventories—
  - Continue to survey the historical range of *Schiedea helleri*.
  - Determine sites that have the highest likelihood of maintaining reintroductions.
- Ungulate monitoring and control— Protect all occurrences against disturbances from feral ungulates. Construct and maintain small-scale fenced exclosures around all populations to prevent imminent extinction.
- Invasive nonnative plant monitoring and control—Continue control of established ecosystem-altering nonnative invasive plant species, and those that compete with *S. helleri*.
- Site and habitat protection—Develop and implement effective control measures to reduce the impact of collection ungulate browsing.
- Fire prevention and control—Continue to develop and implement fire prevention management plans.
- Climate change adaptation strategy—Research suitability of habitat for reintroduction of this species in the future due to the impacts of climate change, including hurricanes.
- Predator and herbivore monitoring and control—Determine and implement effective methods to control slugs.
- 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 reintroduce individuals into suitable habitat that is being managed for known threats to this species to build resiliency and redundancy to reduce impacts of climate change, stochastic events, reduced viability due to low population numbers, and other threats.
- Human interaction monitoring and management—Develop and implement effective measures to reduce impacts of hikers and trail maintenance.
- Population biology research—
  - Determine which species may act as pollinators and which may assist with fruit dispersal.
  - Conduct genetic studies to determine genetic variation within and between populations and plan an effective breeding program.

- 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.

Kishida, W., S. Perlman, and A. Williams. 2018. Hawai‘i Rare Plant Restoration Group (HRPRG) Field Data Form in PEPP 2019: Plant Extinction Prevention Program, FY 2019 Annual Report (Oct 1, 2018-Sep 30, 2019), USFWS CFDA Program #15.657, Endangered Species Conservation-Recovery Implementation Funds, Coop Agreement F18AC00502, December 26, 2019, UH Mānoa, PCSU, PEPP. 192 pp. + appendices. BioPacifica database record for *Schiedea helleri*, Pacific Islands Fish and Wildlife Office.

Lyon Arboretum. 2022. 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.

[NTBG] National Tropical Botanical Garden. 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.

[PEPP] Plant Extinction Prevention Program. 2021. Fiscal year 2021 interim performance report (October 1, 2020-September 30, 2021) cooperative agreements F18AC00502 and F19AC00532, US Fish and Wildlife Service CFDA Program #15.657, Endangered species conservation—recovery implementation funds, University of Hawaii at Manoa, Pacific Cooperative Studies Unit, Plant Extinction Prevention Program.

[USFWS] U.S. Fish and Wildlife Service 2010. *Schiedea helleri* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. *https://ecos.fws.gov/docs/tess/species_nonpublish/1652.pdf.*

[USFWS] 2017. *Schiedea helleri* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. *https://ecos.fws.gov/docs/tess/species_nonpublish/2505.pdf.*

[USFWS] 2020. Endangered and threatened wildlife and plants; initiation of 5-year status reviews for 129 Species in Oregon, Washington, Idaho, Hawaii, Montana, California, and Nevada. Federal Register 85(48): 14240–14243, March 11, 2020.

[USFWS] 2021. Kaua‘i Islandwide Recovery Plan. U.S. Fish and Wildlife Service, Portland, OR. 65 pp. + appendices.

Williams, A. 2017a. Hawai‘i Rare Plant Restoration Group (HRPRG) Field Data Form in PEPP 2019: Plant Extinction Prevention Program, FY 2019 Annual Report (Oct 1, 2018-Sep 30, 2019), USFWS CFDA Program #15.657, Endangered Species Conservation-Recovery Implementation Funds, Coop Agreement F18AC00502, December 26, 2019, UH Mānoa, PCSU, PEPP. 192 pp. + appendices. BioPacifica database record for *Schiedea helleri*, Pacific Islands Fish and Wildlife Office.

Williams, A. 2017b. Hawai‘i Rare Plant Restoration Group (HRPRG) Field Data Form in PEPP 2019: Plant Extinction Prevention Program, FY 2019 Annual Report (Oct 1, 2018-Sep 30, 2019), USFWS CFDA Program #15.657, Endangered Species Conservation-Recovery Implementation Funds, Coop Agreement F18AC00502, December 26, 2019, UH Mānoa, PCSU, PEPP. 192 pp. + appendices. BioPacifica database record for *Schiedea helleri*, Pacific Islands Fish and Wildlife Office.

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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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