

## 5-YEAR REVIEW

Short Form Summary

**Species Reviewed:** *Schiedea attenuata* (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 attenuata* (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/5230>).

### **Review Analysis:**

Please refer to the previous 5-year review for *Schiedea attenuata* published in the Federal Register on September 18, 2017 (available at [https://ecos.fws.gov/docs/tess/species\\_nonpublish/2504.pdf](https://ecos.fws.gov/docs/tess/species_nonpublish/2504.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. attenuata*.

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

New Status Information:

- Previously, the last observation of *Schiedea attenuata* was in 1994, when there were 20 individuals in one population near Kalalau on Kaua‘i (USFWS 2017). Currently, the status of *S. attenuata* is known from surveys conducted using an Unmanned Aerial Vehicle (UAV), which confirmed 4 individuals at the only known population in Kalalau (Nyberg 2020).

New Threats:

- None.

New Management Actions:

- Monitoring and surveys—Currently, monitoring of this species is conducted using UAV by National Tropical Botanical Garden (NTBG) (Nyberg 2020).
- Collection and propagation for genetic storage and reintroduction—
  - Collections were made when the population was discovered in 1991. Plants have been maintained at the University of California, Irvine greenhouse. Plants are inbred, but controlled breeding has been ongoing to select for individuals with higher fitness and those seeds have been sent to both NTBG and Lyon Arboretum (UCI 2020).
  - NTBG reports approximately 100 seeds in storage from one wild founder plant, and 65 seeds in storage from one plant grown in cultivation (NTBG 2021).
  - Lyon Arboretum reports 440 seeds from two individuals from Kalalau (Lyon Arboretum 2022).

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

<b>Date</b>	<b>No. wild individuals</b>	<b>No. outplanted</b>	<b>Stability Criteria identified in Recovery Plan</b>	<b>Stability Criteria Completed?</b>
2010 (listing and critical habitat)	20	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
<b>Date</b>	<b>No. wild individuals</b>	<b>No. outplanted</b>	<b>*Preventing Extinction Criteria identified by HPPRCC</b>	<b>*Preventing Extinction Criteria Completed?</b>
2017 (5-year review)	0-20	0	All threats managed in all 3 populations	No
			Reproduction (i.e., viable seeds, seedlings, saplings) at all three populations	Unknown
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2022 (5-year review)	4	0	All threats managed in all three populations	No
			Complete genetic storage	Partial
			Natural reproduction at all three populations	Unknown
			Three populations with 150 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 attenuata* 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
Degradation and destruction by landslides	A	Ongoing	None
Predation and herbivory by ungulates	C	Ongoing	None
Lack of adequate hunting regulations	D	Ongoing	None
Lack of adequate biosecurity legislation	D	Ongoing	None
Invasive species— Established invasive species competition	E	Ongoing	None
Reduced viability due to low numbers	E	Ongoing	None

**Synthesis:**

Currently, there are approximately 4 wild individuals of *Schiedea attenuata* on Kaua‘i in one location along a cliff that likely remains inaccessible to conservation personnel but can be observed with UAV. Collections were made when the population was discovered and has since remained in cultivation, though inbreeding depression may be impacting the cultivated progeny. Collections of rediscovered plants have not yet been made.

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 attenuata* is a short-lived perennial shrub known from a single location. 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 150 individuals total (or the total number of individuals if fewer than 50 exist) from known populations represented in *ex situ* (secured off-site, such as a nursery or seed bank) collections that are well managed. In addition, the species should be documented from all known populations on Kauaʻi where they now occur or occurred historically and each of these populations must be naturally reproducing (i.e., viable seeds, seedlings), with a total minimum of 150 mature, reproducing individuals.

The preventing extinction goals for this species have not been met. Genetic storage is not complete (Table 1), there are only four known individuals, and all threats are not being managed (Table 1, Table 2). Therefore, *Schiedea attenuata* 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 population of *Schiedea attenuata*, as well as suitable habitat for new populations.
  - Determine sites that have the highest likelihood of maintaining reintroductions.
- Ungulate monitoring and control—Protect all occurrences against browsing and disturbances from feral ungulates. Construct and maintain fenced exclosures around existing populations to prevent imminent extinction.
- Invasive nonnative plant monitoring and control—Control established ecosystem-altering nonnative invasive plant species, and those that compete with *S. attenuata*.
- Site and habitat protection—Develop and implement effective control measures to reduce the impact of ungulates.
- 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.
- Captive propagation for genetic storage and reintroduction—Establish collection and propagation efforts for maintenance of genetic stock and for reintroduction.
- Reintroduction and translocation—Reintroduce individuals into suitable habitat within historic range that is being managed for known threats to this species to build resiliency and redundancy to reduce impacts of reduced viability due to low numbers, stochastic events, climate change, and other threats.
- 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 the population 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.

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.

Nyberg, B. 2020. Endangered surveys using unmanned aerial vehicle. National Tropical Botanical Garden, Kalaheo. Unpublished report submitted to the U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office, Honolulu, Hawai‘i. 10 pp.

[UCI] University of California, Irvine. 2020. 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. 2017. *Schiedea attenuata* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. [https://ecos.fws.gov/docs/tess/species\\_nonpublish/2504.pdf](https://ecos.fws.gov/docs/tess/species_nonpublish/2504.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.

Wagner, W., S. Weller, and A. Sakai. 1994. Description of a rare new cliff-dwelling species from Kauai, *Schiedea attenuata* (Caryophyllaceae). Novon 4: 187–190.

**U.S. FISH AND WILDLIFE SERVICE**

SIGNATURE PAGE for 5-YEAR REVIEW of *Schiedea attenuata* (no common name)

**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
- No Change in listing status

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

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Date\_\_\_\_\_