

Schiedea sarmentosa
(no common name)

**5-Year Review
Summary and Evaluation**

**U.S. Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
Honolulu, Hawaii**

5-YEAR REVIEW

Species reviewed: *Schiedea sarmentosa* / no common name

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5-YEAR REVIEW
***Schiedea sarmentosa* (no common name)**

1.0 GENERAL INFORMATION

1.1 Reviewers

Lead Regional Office:

Region 1, Endangered Species Program, Division of Recovery, Jesse D'Elia, (503) 231-2071

Lead Field Office:

Pacific Islands Fish and Wildlife Office, Loyal Mehrhoff, Field Supervisor, (808) 792-9400

Cooperating Field Office(s):

N/A

Cooperating Regional Office(s):

N/A

1.2 Methodology used to complete the review:

This review was conducted by staff of the Pacific Islands Fish and Wildlife Office of the U.S. Fish and Wildlife Service (USFWS), beginning on March 16, 2009. The review was based on final critical habitat designations for *Schiedea sarmentosa* and other species from the island of Molokai (USFWS 2003) as well as a review of current, available information. The National Tropical Botanical Garden provided an initial draft of portions of the review and recommendations for conservation actions needed prior to the next five-year review. The evaluation of Samuel Aruch, biological consultant, was reviewed by the Plant Recovery Coordinator. The document was then reviewed by the Recovery Program Lead and the Assistant Field Supervisor for Endangered Species before submission to the Deputy Field Supervisor for approval.

1.3 Background:

1.3.1 Federal Register (FR) Notice citation announcing initiation of this review:

[USFWS] U.S. Fish and Wildlife Service. 2009. Endangered and threatened wildlife and plants; initiation of 5-year reviews of 103 species in Hawaii. Federal Register 74(49):11130-11133.

1.3.2 Listing history

Original Listing

FR notice: USFWS. 1996. Endangered and threatened wildlife and plants; determination of threatened or endangered status for three plant species (*Cyanea dunbarii*, *Lysimachia maxima*, and *Schiedea sarmentosa*) plants from the island of Molokai, Hawaii; final rule. Federal Register 61(198):53130-53137.

Date listed: October 10, 1996

Entity listed: Species

Classification: Endangered

Revised Listing, if applicable

FR notice: N/A

Date listed: N/A

Entity listed: N/A

Classification: N/A

1.3.3 Associated rulemakings:

USFWS. 2003. Endangered and threatened wildlife and plants; final designations and nondesignations of critical habitat for 42 plant species from the island of Molokai, Hawaii; final rule. Federal Register 68(52):12982-13141.

Critical habitat was designated for *Schiedea sarmentosa* in two units totaling 874 hectares (2159 acres) on the island of Molokai. This designation includes habitat on State and private lands (USFWS 2003).

1.3.4 Review History:

Species status review [FY 2010 Recovery Data Call (September 2010)]: Improving

Recovery achieved:

1 (0-25%) (FY 2007 Recovery Data Call – most recent year reported)

1.3.5 Species' Recovery Priority Number at start of this 5-year review:

8

1.3.6 Current Recovery Plan or Outline

Name of plan or outline: U.S. Fish and Wildlife Service. 1998. Molokai II: Addendum to the recovery plan for the Molokai plant cluster. U.S. Fish and Wildlife Service, Portland, Oregon. 52 pages.

Date issued: May 20, 1998.

Dates of previous revisions, if applicable: N/A

2.0 REVIEW ANALYSIS

2.1 Application of the 1996 Distinct Population Segment (DPS) policy

2.1.1 Is the species under review a vertebrate?

Yes

No

2.1.2 Is the species under review listed as a DPS?

Yes

No

2.1.3 Was the DPS listed prior to 1996?

Yes

No

2.1.3.1 Prior to this 5-year review, was the DPS classification reviewed to ensure it meets the 1996 policy standards?

Yes

No

2.1.3.2 Does the DPS listing meet the discreteness and significance elements of the 1996 DPS policy?

Yes

No

2.1.4 Is there relevant new information for this species regarding the application of the DPS policy?

Yes

No

2.2 Recovery Criteria

2.2.1 Does the species have a final, approved recovery plan containing objective, measurable criteria?

Yes

No

2.2.2 Adequacy of recovery criteria.

2.2.2.1 Do the recovery criteria reflect the best available and most up-to date information on the biology of the species and its habitat?

Yes

_____ *No*

2.2.2.2 Are all of the 5 listing factors that are relevant to the species addressed in the recovery criteria?

 X *Yes*

_____ *No*

2.2.3 List the recovery criteria as they appear in the recovery plan, and discuss how each criterion has or has not been met, citing information:

A synthesis of the threats (Listing Factors A, C, D, and E) affecting this species is presented in section 2.3.2 and Table 2. Listing Factor B (overutilization for commercial, recreational, scientific, or educational purposes) is not known to be a threat to this species.

Stabilizing, downlisting, and delisting objectives are provided in the the addendum to the recovery plan for the Molokai plant cluster (USFWS 1998), based on whether the species is an annual, a short-lived perennial (fewer than 10 years), or a long-lived perennial. *Schiedea sarmentosa* is a short-lived perennial, and to be considered stabilized, which is the first step in recovering the species, the taxon must be managed to control threats (*e.g.*, fenced, weeding, etc.) and be represented in an *ex situ* (off-site) collection. In addition, a minimum of three populations should be documented on Molokai, where they now occur or occurred historically. Each of these populations must be naturally reproducing and increasing in number, with a minimum of 50 mature individuals per population.

There are three confirmed populations with more than 50 individuals and some threats are being managed. This recovery objective has been partially met.

For downlisting, a total of five to seven populations of *Schiedea sarmentosa* should be documented on islands where they now occur or occurred historically. Each of these populations must be naturally reproducing, stable or increasing in number, and secure from threats, with a minimum of 300 mature individuals per population. Each population should persist at this level for a minimum of five consecutive years before downlisting is considered.

There are only three confirmed populations. This recovery objective has not been met.

For delisting, a total of eight to ten populations of *Schiedea sarmentosa* should be documented on islands where they now occur or occurred

historically. Each of these populations must be naturally reproducing, stable or increasing in number, and secure from threats, with 300 mature individuals per population for short-lived perennials. Each population should persist at this level for a minimum of five consecutive years before delisting is considered.

This recovery objective has not been met.

2.3 Updated Information and Current Species Status

No new information.

2.3.1 Biology and Habitat

2.3.1.1 New information on the species' biology and life history:

No new information.

2.3.1.2 Abundance, population trends (e.g. increasing, decreasing, stable), demographic features (e.g., age structure, sex ratio, family size, birth rate, age at mortality, mortality rate, etc.), or demographic trends:

At the time the recovery plan was written, *Schiedea sarmentosa* had two populations, located at Makolelau Gulch and Onini Gulch on Molokai, totaling 330 to 1,000 individuals (Hawaii Biodiversity and Mapping Program 2009; USFWS 1998). The population west of Makolelau Gulch, below Puu Kolekole, which was visited from 1987 to 1997, had between 50 and 300 individuals in 1997, at 640 to 853 meters (2,100 to 2,800 feet) elevation (Hawaii Biodiversity and Mapping Program 2009; Perlman 2010; Wood 2010). The population at East Kawela was located at 792 to 823 meters (2,600 to 2,700 feet) elevation (Wood 2010). A third population in an unnamed gulch east of East Kawela Gulch and west of Makolelau at 799 meters (2,620 feet) elevation contained approximately 140 individuals when visited in September 2008 (Perlman 2010). The population was revisited in January 2009 by Hank Oppenheimer of the Plant Extinction Prevention Program who saw thousands of individuals (Oppenheimer 2010). In April of the same year, Oppenheimer observed about 40 individuals in the next gulch east of the unnamed gulch.

As of 2010, there are three populations known containing as many as several thousand individuals between them.

2.3.1.3 Genetics, genetic variation, or trends in genetic variation (e.g., loss of genetic variation, genetic drift, inbreeding, etc.):

No new information.

2.3.1.4 Taxonomic classification or changes in nomenclature:

No new information.

Spatial distribution, trends in spatial distribution (e.g. increasingly fragmented, increased numbers of corridors, etc.), or historic range (e.g., corrections to the historical range, change in distribution of the species within its historic range, etc.):

See section 2.3.1.2 above.

2.3.1.5 Habitat or ecosystem conditions (e.g., amount, distribution, and suitability of the habitat or ecosystem):

The habitat where *Schiedea sarmentosa* occurs is *Dodonaea viscosa* (aalii) – *Leptecophylla tameiameia* (pukiawe) shrubland, or *Metrosideros polymorpha* (ohia) – *D. viscosa* mixed low shrubland or mixed mesic montane habitat with *Alyxia stellata* (maile), *Antidesma platyphyllum* (hame), *Bidens menziesii* (kookoolau), *Bobea* sp. (ahakea), *Carex meyenii* (no common name [NCN]), *Euphorbia celastroides* var. *amplectens* (akoko), *Chenopodium oahuense* (aheahea), *Cocculus orbiculatus* (huehue), *Coprosma* sp. (pilo), *Cyperus faurei* (NCN), *Diospyros sandwicensis* (lama), *Dubautia linearis* (naenae), *Eragrostis variabilis* (kawelu), *Lepidium bidentatum* (anaunau), *Lipochaeta rockii* (nehe), *Luzula hawaiiensis* (wood rush), *Lysimachia* sp. (NCN), *Melicope hawaiiensis* (mokihana kukae moa), *Myoporum sandwicense* (naio), *Myrsine lanaiensis* (kolea), *Neraudia sericea* (NCN), *Nestegis sandwicensis* (olopua), *Osteomeles anthyllidifolia* (ulei), *Panicum* spp. (NCN), *Pipturus* sp. (mamake), *Pittosporum argentifolium* (hoawa), *Pleomele auwahiensis* (hala pepe), *Psychotria* sp. (kopiko), *Pteridium aquilinum* var. *decompositum* (kilau), *Scaevola* sp. (naupaka), *Schiedea lydgatei* (NCN), *Sicyos*

waimanaloensis (anunu), *Sida fallax* (ilima), *Silene alexandri* (NCN), *S. lanceolata* (NCN), *Sophora chrysophylla* (mamane), *Spermolepis hawaiiensis* (NCN), *Streblus pendulinus* (ai ai), *Urera glabra* (opuhe), *Vaccinium* sp. (ohelo), *Viola chamissoniana* (pamakani), and *Wikstroemia* spp. (akia) (Hawaii Biodiversity and Mapping Program 2009; National Tropical Botanical Garden 2009; Oppenheimer 2010; Perlman 2010; Wood 2010).

2.3.1.6 Other:

No new information.

2.3.2 Five-Factor Analysis (threats, conservation measures, and regulatory mechanisms)

2.3.2.1 Present or threatened destruction, modification or curtailment of its habitat or range:

Threats to the habitat of *Schiedea sarmentosa* include feral goats (*Capra hircus*), fire, and invasive introduced plants such as *Ageratina adenophora* (sticky snakeroot), *Grevillea robusta* (silk oak), *Lantana camara* (lantana), *Melinis minutiflora* (molasses grass), *Neonotonia wightii* (NCN), and *Schinus terebinthifolius* (Christmas berry) (Oppenheimer 2010; Perlman 2010; Wood 2010).

2.3.2.2 Overutilization for commercial, recreational, scientific, or educational purposes:

Not a threat.

2.3.2.3 Disease or predation:

Goats, rats (*Rattus* spp.), and slugs (unidentified species) may eat parts of this plant (Perlman 2010; Wood 2010). Spittle bugs (the juvenile stage of certain leafhoppers) were observed on this species in April 2009 (Oppenheimer 2010).

2.3.2.4 Inadequacy of existing regulatory mechanisms:

No new information.

2.3.2.5 Other natural or manmade factors affecting its continued existence:

The introduced invasive plant species discussed in section 2.3.2.1 above are also a threat to *Schiedea sarmentosa* because they compete with the species for water, light, and nutrients.

Climate change may also pose a threat to this species. However, current climate change analyses in the Pacific Islands lack sufficient spatial resolution to make predictions on impacts to this species. The Pacific Islands Climate Change Cooperative has currently funded climate modeling that will help resolve these spatial limitations. We anticipate high spatial resolution climate outputs by 2013.

The University of California at Irvine has 12 propagules in storage (University of California, Irvine 2010).

At least one group of plants in the Makolelau area is fenced (National Tropical Botanical Garden 2009). The East Molokai Watershed Partnership maintains a fence and conducts feral ungulate control, which is one of the most important management actions being taken for this species and its habitat (Oppenheimer 2010).

In 2009, one million dollars in funds from the federal Department of Interior's Cooperative Endangered Species Conservation Fund was designated for use on Molokai, to help acquire a perpetual conservation easement over 248 hectares (614 acres) of strategic watershed on the eastern end of the island. The property has several federally listed threatened or endangered species as well as critical habitat in and around the proposed easement area. Among federally listed species that will benefit from this protection are *Cyanea manii* (haha), *Canavalia molokaiensis* (awikiwiki), *Hibiscus arnottianus* ssp. *immaculatus* (kokio keokeo), *Brighamia rockii* (puaala), *Cyanea dunbariae* (haha), *Gardenia brighamii* (nanu), *Pritchardia munroi* (loulou), and *Phyllostegia hispida* (USFWS 2009; C. Rowland, USFWS, pers. comm. 2010). This species may also benefit from this action.

2.4 Synthesis

Stabilizing, downlisting, and delisting objectives are provided in the addendum to the recovery plan for the Molokai plant cluster (USFWS 1998), based on whether the species is an annual, a short-lived perennial (fewer than ten years), or a long-lived perennial. *Schiedea sarmentosa* is a short-lived perennial, and

to be downlisted, a total of five to seven populations of *Schiedea sarmentosa* should be documented on islands where they now occur or occurred historically. Each of these populations must be naturally reproducing, stable or increasing in number, and secure from threats, with a minimum of 300 mature individuals per population. Each population should persist at this level for a minimum of five consecutive years before downlisting is considered.

The downlisting goals for this species have not been met as there are only three known populations with an estimated several thousands of individuals (Table 1) and all threats are not being managed (Table 2). Therefore, *Schiedea sarmentosa* meets the definition of endangered as it remains in danger of extinction throughout its range.

Table 1. Status of *Schiedea sarmentosa* from listing through 5-year review.

Date	No. wild indivs	No. outplanted	Downlisting Criteria identified in Recovery Plan	Downlisting Criteria Completed?
1996 (listing)	<1,000	0	All threats managed in all 5-7 populations	No
			Complete genetic storage	No
			5-7 populations with 300 mature individuals each	No
1998 (recovery plan)	330-1,000	0	All threats managed in all 5-7 populations	No
			Complete genetic storage	No
			5-7 populations with 300 mature individuals each	No
2003 (critical habitat)	>1,000	0	All threats managed in all 5-7 populations	No
			Complete genetic storage	No
			5-7 populations with 300 mature individuals each	No
2010 (5-year review)	Several 1,000s	0	All threats managed in all 5-7 populations	Partially (Table 2)
			Complete genetic storage	Partially
			5-7 populations with 300 mature individuals each	Partially: 50-300 west of Makolelau Gulch; unknown number East Kawela; 1,000s east of East Kawela Gulch

Table 2. Threats to *Schiedea sarmentosa*.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Ungulates – habitat modification and herbivory	A, C, D	Ongoing	Partially: one population partially fenced in Makolelau
Rats – herbivory	C	Ongoing	No
Slugs – herbivory	C	Ongoing	No
Spittle bugs – herbivory	C	Ongoing	No
Fire	E	Ongoing	No
Invasive introduced plants	A, E	Ongoing	No
Climate change	A, E	Increasing	No

3.0 RESULTS

3.1 Recommended Classification:

Downlist to Threatened

Uplist to Endangered

Delist

Extinction

Recovery

Original data for classification in error

No change is needed

3.2 New Recovery Priority Number:

Brief Rationale:

3.3 Listing and Reclassification Priority Number:

Reclassification (from Threatened to Endangered) Priority Number: _____

Reclassification (from Endangered to Threatened) Priority Number: _____

Delisting (regardless of current classification) Priority Number:

Brief Rationale:

4.0 RECOMMENDATIONS FOR FUTURE ACTIONS

- Conduct surveys where *Schiedea sarmentosa* has been reported to determine current status of the species.
- Continue collection of seeds or cuttings for genetic storage and reintroduction.
- Monitor known populations.
- Fence all populations to provide protection from the negative impacts of feral ungulates.
- Control invasive introduced plant species around all populations.
- Control rats in the vicinity of these populations.
- Develop and implement methods to control slugs and spittle bugs.
- Establish additional populations within protected suitable habitat.
- Develop and implement a wildfire management plan.
- Work with the East Molokai Watershed Partnership and other land managers to initiate planning and contribute to implementation of ecosystem-level restoration and management to benefit this species.
- Assess the modeled effects of climate change on this species, and use to determine future landscape needed for the recovery of the species.

5.0 REFERENCES

- Hawaii Biodiversity and Mapping Program. 2009. Program database. University of Hawaii at Manoa, Honolulu, Hawaii. Unpublished.
- National Tropical Botanical Garden. 2009. Herbarium database. National Tropical Botanical Garden, Kalaheo, Hawaii. Unpublished.
- Oppenheimer, H. 2010. *Schiedea sarmentosa* 5-year review edits and comments. Plant Extinction Prevention Program, Lahaina, Hawaii. 5 pages. Unpublished.
- Perlman, S. 2010. *Schiedea sarmentosa*. National Tropical Botanical Garden, Kalaheo, Hawaii. 2 pages. Unpublished.

University of California, Irvine. 2010. Report on controlled propagation of listed and candidate species, as designated under the U.S. Endangered Species Act. University of California, Irvine, California. Unpublished.

[USFWS] U.S. Fish and Wildlife Service. 1998. Molokai II: Addendum to the recovery plan for the Molokai plant cluster. U.S. Fish and Wildlife Service, Portland, Oregon. 52 pages. Available online at <http://www.fws.gov/pacificislands/recoveryplans.html>.

[USFWS] U.S. Fish and Wildlife Service. 2003. Endangered and threatened wildlife and plants; final designations and nondesignations of critical habitat for 42 plant species from the island of Molokai, Hawaii; final rule. Federal Register 68(52):12982-13141.

[USFWS] U.S. Fish and Wildlife Service. 2009. Press release: Fish and Wildlife Service provides \$1 million in land acquisition funds to Hawaii. Honolulu, Hawaii. April 17, 2009.

Wood, K.R. 2010. Notes on *Schiedea sarmentosa*. National Tropical Botanical Garden, Kalaheo, Hawaii. 2 pages. Unpublished.

Personal Communications:

Rowland, Craig. 2010. Conservation Partnerships Program Coordination, USFWS, Honolulu, Hawaii. E-mail to Marie Bruegmann, USFWS, dated April 16, 2010. Subject: Additional information on status of Molokai easement.

Signature Page
U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW of *Schiedea sarmentosa* (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

Appropriate Listing/Reclassification Priority Number, if applicable: _____

Review Conducted By:

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