

Schiedea spergulina var. *leiopoda*
(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 spergulina* var. *leiopoda* (no common name)

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5-YEAR REVIEW

Schiedea spergulina var. *leiopoda*

1.0 GENERAL INFORMATION

1.1 Reviewers

Lead Regional Office:

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(503) 231-2071

Lead Field Office:

Pacific Islands Fish and Wildlife Office, Loyal Mehrhoff, Field Supervisor, (808)
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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 April 29, 2008. The review was based on the final critical habitat designation for *Schiedea spergulina* var. *leiopoda* and other species from the island of Kauai (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 Assistant Field Supervisor for Endangered Species and Acting Deputy Field Supervisor before submission to the Field Supervisor for approval.

1.3 Background:

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

USFWS. 2008. Endangered and threatened wildlife and plants; initiation of 5-year status reviews of 70 species in Idaho, Montana, Oregon, Washington, and the Pacific Islands. Federal Register 73(83):23264-23266.

1.3.2 Listing history

Original Listing

FR notice: USFWS. 1994. Endangered and threatened wildlife and plants; determination of endangered or threatened status for 24 plants from the island of Kauai, Hawaii; final rule. Federal Register 59(38):9304-9329.

Date listed: February 25, 1994

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 rule makings :

USFWS. 2003. Endangered and threatened wildlife and plants; final designation or nondesignation of critical habitat for 95 plant species from the islands of Kauai and Niihau, Hawaii; final rule. Federal Register 68(39):9116-9479.

Critical habitat was designated for *Schiedea spergulina* var. *leiopoda* in one unit totaling five hectares (11 acres) on the island of Kauai. This designation includes habitat on private land (USFWS 2003).

1.3.4 Review History:

Species status review [FY 2009 Recovery Data Call (September 2009)]:
Improving

Recovery achieved:

1 (0-25%) (FY 2007 Recovery Data Call -- this was the last year this was reported)

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

6

1.3.6 Current Recovery Plan or Outline

Name of plan or outline: U.S. Fish and Wildlife Service. 1995.

USFWS. 1995. Recovery plan for the Kauai plant cluster. U.S. Fish and Wildlife Service, Portland, Oregon. 270 pages.

Date issued: September 20, 1995

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?

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 (Factors A, C, D, and E) affecting this species is presented in section 2.4. 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 recovery plan for the Kauai plant cluster (USFWS 1995), based on whether the species is an annual, a short-lived perennial (fewer than 10 years), or a long-lived perennial. *Schiedea spergulina* var. *leiopoda* 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* (at other than the plant's natural location, such as a nursery or arboretum) collection. In addition, a minimum of three populations should be documented on Kauai. Each of these populations must be naturally reproducing and increasing in number, with a minimum of 50 mature individuals per population.

This recovery objective has not been met.

For downlisting, a total of five to seven populations of *Schiedea spergulina* var. *leiopoda* 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.

This recovery objective has not been met.

For delisting, a total of eight to ten populations of *Schiedea spergulina* var. *leiopoda* 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

In addition to the status summary table below, information on the species' status and threats was included in the final critical habitat rule referenced above in section 1.3.3 ("Associated Rulemakings") and in section 2.4 ("Synthesis") below, which also includes any new information about the status and threats of the species.

Table 1. Status of *Schiedea spergulina* var. *leiopoda* from listing through 5-year review.

Date	No. wild individuals	No. outplanted	Stabilization Criteria identified in Recovery Plan	Stabilization Criteria Completed?
1994 (listing)	50-100	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
1995 (recovery plan)	50-100	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2003 (critical habitat)	135-150	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)	120-325	0	All threats managed	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No

2.3.1 Biology and Habitat

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

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:

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

2.3.1.4 Taxonomic classification or changes in nomenclature:

2.3.1.5 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.):

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

2.3.1.7 Other:

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:

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

2.3.2.3 Disease or predation:

2.3.2.4 Inadequacy of existing regulatory mechanisms:

2.3.2.5 Other natural or manmade factors affecting its continued existence:

2.4 Synthesis

Schiedea spergulina is endemic to the island of Kauai. Historically, *Schiedea spergulina* var. *leiopoda* was found on a ridge on the east side of Hanapepe on Kauai and one population of approximately 50 to 100 individuals was known on the west side of Lawai Valley on Kauai, on a plateau and adjacent cliffs above the McBryde Garden of the

National Tropical Botanical Garden (National Tropical Botanical Garden 2008; USFWS 1995). Currently the Hanapepe population has not been seen for many years, and the Lawai Valley population has between 120 to 325 individuals, including mature, immature, and seedlings. Seeds have been collected from 160 different individuals in the last four years (National Tropical Botanical Garden 2008; Perlman 2009; N, Tangalin, National Tropical Botanical Garden, pers. comm. 2009).

National Tropical Botanical Garden collected leaves from 32 *Schiedea spergulina* individuals at each of two populations on the Waimea Rim in May 2008. A researcher at the University of South Dakota will be assessing genetic diversity for these populations as a measure of genetic health, using microsatellites. Population level sampling will also assess the degree of gene flow between populations of the same species, and interspecific gene flow between other Kauai *Schiedea* species. Results of these studies will be published when the work is completed (Willyard 2008).

Two varieties of *Schiedea spergulina*, *Schiedea spergulina* var. *leiopoda* and *Schiedea spergulina* var. *spergulina*, previously recognized by Wagner on the basis of the presence or absence of pubescence, and geographical separation, have more recently been recombined as one taxon without varietal distinction. The presence of hairs is a characteristic of variation within other *Schiedea* species, and is noted to be a changeable characteristic (Wagner and Herbst 2003; Wagner *et al.* 2005). At present, *Schiedea spergulina* var. *leiopoda* is federally listed as endangered and *Schiedea spergulina* var. *spergulina* is listed as threatened.

The Lawai Valley population of *Schiedea spergulina* var. *leiopoda* grows on cliffs with invasive introduced plant dominated dry forest and shrubland at 19 to 116 meters (61 to 380 feet) elevation, associated with introduced species such as *Casuarina equisetifolia* (common ironwood), *Desmodium incanum* (Spanish clover), *Eucalyptus* spp., *Eugenia cumini* (Java plum), *Furcraea foetida* (Mauritius hemp), *Schefflera actinophylla* (octopus tree), *Schinus terebinthifolius* (Christmasberry), and *Stachytarpheta urticifolia* (no common name [NCN]) (National Tropical Botanical Garden 2008; Perlman 2009; Wood 2009). Native plants associated with the Lawai population are *Bidens sandvicensis* (kookoolau), *Dodonaea viscosa* (aalii), *Wikstroemia uva-ursi* var. *kauaiensis* (akia), *Doryopteris* sp. (kumuniu), *Heteropogon contortus* (pili), *Peperomia blanda* var. *floribunda* (ala ala wai nui), *Plectranthus parviflorus* (ala ala wai nui wahine), and *Waltheria indica* (uhaloa) (Lorence and Burney 2005; N. Tangalin, pers. comm. 2009).

The habitat on Lawai Valley's west facing cliffs is dominated by invasive introduced plant species, including *Bidens pilosa* (Spanish needle), *Bromus* sp. (brome grass, chess, quaking grass), *Bryophyllum pinnatum* (airplant), *Chrysopogon aciculatus* (golden beard grass), *Cyanthillium cinerarium* (ironweed), *Furcraea foetida* (Mauritius hemp), *Lantana camara* (lantana), *Leucaena leucocephala* (koa haole), *Melinis repens* (redtop Natal grass), *Panicum maximum* (guinea grass), *Psidium guajava* (common guava), *Rhynchelytrum repens* (Natal grass), *Schefflera actinophylla*, *Schinus terebinthifolius*, *Setaria parviflora* (yellow foxtail), and *Syzygium cumini* (Java plum). *Eucalyptus* sp. (eucalyptus) is planted below and between the coffee fields and the cliff in Lawai, but

does not appear to be spreading (Factor E) (National Tropical Botanical Garden 2008). Climate change may also pose a threat to *Schiedea spergulina* var. *leiopoda* (Factors A and E). However, current climate change models do not allow us to predict specifically what those effects, and their extent, would be for this species.

A restoration project was undertaken on the Lawai cliff site from 2005 to 2008 under a Wildlife Habitat Incentives Program grant from the U.S. Department of Agriculture, Natural Resources Conservation Service. Activities conducted under the grant included mapping and tagging of all naturally occurring individuals, removal of invasive species, collection of seeds and cuttings, and propagation of plants for augmentation (Lorence and Burney 2005). Reintroduction of 281 individuals of *Schiedea spergulina* with a wide representation of founder individuals, as well as restoration of over 600 individuals of associated native species, has been completed (C. Adams, National Tropical Botanical Garden, pers. comm. 2009). The National Tropical Botanical Garden has over 2,000 seeds in genetic storage and over 900 seedlings have been propagated (National Tropical Botanical Garden 2009).

The interim stabilization goals for this species have not been met (see Table 1), as only one wild population with many augmented individuals is known. Therefore, *Schiedea spergulina* var. *leiopoda* meets the definition of endangered as it remains in danger of extinction throughout its range, as the taxon was listed.

3.0 RESULTS

3.3 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

- Continue control of invasive introduced plant species at the one known population.
- Continue to collect for adequate genetic storage and reintroduction.
- Establish additional populations.
- Conduct surveys throughout historical range to determine the current status of the species as a whole, which is necessary before the species can be reclassified.
- Work with Hawaii Division of Forestry and Wildlife to initiate planning and contribute to implementation of ecosystem-level restoration and management to benefit future reintroduced populations of this species.
- Update the listed entity on 50 CFR 17 to match the currently recognized taxonomy after a thorough status survey has been completed.

5.0 REFERENCES

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Personal Communications:

Adams, Cynthia. 2009. Administrative Assistant, Conservation Department, National Tropical Botanical Garden, Kalaheo, Hawaii. E-mail to Margaret Clark, National Tropical Botanical Garden, dated February 8, 2009. Subject: *Schiedea spergulina* outplanting.

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Signature Page
U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW of *Schiedea spergulina* var. *leiopoda* (no common name)

Current Classification: _____ E _____

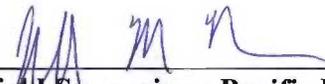
Recommendation resulting from the 5-Year Review:

- Downlist to Threatened
- Uplist to Endangered
- Delist
- No change needed

Appropriate Listing/Reclassification Priority Number, if applicable: _____

Review Conducted By:

Marie Bruegmann, Plant Recovery Coordinator
Marilet A. Zablan, Assistant Field Supervisor for Endangered Species
Jeff Newman, Acting Deputy Field Supervisor

Approved  Date **AUG 27 2010**
for **Field Supervisor, Pacific Islands Fish and Wildlife Office**