

Sanicula mariversa
(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: *Sanicula mariversa* (No common name)

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5-YEAR REVIEW
***Sanicula mariversa* (No common name)**

1.0 GENERAL INFORMATION

1.1 Reviewers

Lead Regional Office:

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

Lead Field Office:

Pacific Islands Fish and Wildlife Office, Gina Shultz, Assistant Field Supervisor for Endangered Species, (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 (PIFWO) of the U.S. Fish and Wildlife Service (USFWS) between June 2006 and June 2007. The Hawaii Biodiversity and Mapping Program provided most of the updated information on the current status of *Sanicula mariversa*. They also provided recommendations for conservation actions that may be needed prior to the next five-year review. The evaluation of the lead PIFWO biologist was reviewed by the Plant Recovery Coordinator. These comments were incorporated into the draft five-year review. The document was then reviewed by the Recovery Program Leader and the Assistant Field Supervisor for Endangered Species before final approval.

1.3 Background:

1.3.1 FR Notice citation announcing initiation of this review:

USFWS. 2006. Endangered and threatened wildlife and plants; initiation of 5-year reviews of 70 species in Idaho, Oregon, Washington, Hawaii, and Guam. Federal Register 71(69):18345-18348.

1.3.2 Listing history

Original Listing

FR notice: USFWS. 1991. Determination of endangered for 26 plants from the Waianae Mountains, island of Oahu, Hawaii; final rule. Federal Register 56(209):55770-55786.

Date listed: October 29, 1991

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 designation or nondesignation of critical habitat for 101 plant species from the island of Oahu, HI: final rule. Federal Register 68(116):35949-36406.

Critical habitat was designated for *Sanicula mariversa* in six units totaling 794 hectares (230 acres) on Oahu. This designation includes habitat on state and private lands (USFWS 2003).

1.3.4 Review History:

Species status review [FY 2006 Recovery Data Call (September 2006)]:

Stable

Recovery achieved:

1 (0-25%) (FY 2006 Recovery Data Call)

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

5

1.3.6 Current Recovery Plan or Outline

Name of plan or outline: Recovery plan for the Oahu Plants. 1998. U.S. Fish and Wildlife Service, Portland, Oregon. 270+ pages.

Date issued: August 10, 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?

 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 (Factors A, D, and E) affecting this species is presented in section 2.4. Factors B (overutilization for commercial, recreational, scientific, or educational purposes) and C (disease or predation) are not known to be threats to this species.

Stabilizing, downlisting, and delisting objectives are provided in the recovery plan for Oahu Plants (USFWS 1998), based on whether the species is an annual, a short-lived perennial (fewer than 10 years), or a long-lived perennial. *Sanicula mariversa* is a short-lived perennial, and to be considered stable, the taxon must be managed to control threats (*e.g.*, fenced) 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 Oahu. 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 *Sanicula mariversa* should be documented on Oahu. 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 *Sanicula mariversa* should be documented on Oahu. 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.

Status of *Sanicula mariversa* from listing through 5-year review.

Date	No. wild inds	No. outplanted	Stability Criteria	Stability Criteria Completed?
1991 – listing	Fewer than 100	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
1998 – recovery plan	ca 75	Unknown	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2003 – critical habitat	170	19	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2007 – 5-yr review	188	0	All threats managed all 3 populations	Partially
			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

Historically, *Sanicula mariversa* was known from the central Waianae Mountains from Makua-Keaau Ridge to Kaluaa-Lualualei Summit Ridge (USFWS 1995). At the time the recovery plan was published there were two populations containing approximately 75 individuals total (USFWS 1998). In 2006, 18 mature and 170 immature individuals were reported from the same two populations (U.S. Army 2006a).

Sanicula mariversa occurs in mesic habitats. The species usually occurs on north-facing slopes just off the ridge tops. Most of the known plants grow in deep soil. However, some plants have been observed to grow in the cracks of nearly vertical rock faces. In Makua and Keaau, most of the *S. mariversa* plants are growing at sites now dominated by the annual, non-native grasses *Vulpia* sp. (annual fescue) and *Bromus mollis* (soft chess). The remnants of the native vegetation at these sites,

together with the composition of similar, but more intact locations in the Waianae Mountains, indicate that the native vegetation was originally a mix of native sedges, grasses, herbs, ferns, and shrubs, with a good percentage of the ground covered by lichens and mosses. At one of the sites in Makua, the plants are growing where *Metrosideros* spp. (ohia lehua) shrubland grades into open slopes (Makua Implementation Team 2003).

Population sizes for this species have been difficult to record and assess, in part due to lack of information on the life cycle of the species. Recently, through observation of wild and cultivated plants, *Sanicula mariversa* has been found to be a monocarpic perennial, which upon reaching maturity after a number of years, flowers and fruits only once, and then dies. In some years, flowering and fruiting may not occur in certain of its populations (U.S. Army 2006a). Because of *S. mariversa*'s life cycle, the number of plants within a population can fluctuate widely from year to year. Population monitoring standards need to be further developed for better understanding of the population trends for this species (U.S. Army 2006a).

The primary threats to *Sanicula mariversa* included habitat degradation by feral goats (*Sus scrofa*) (Factors A and D); competition from invasive introduced plants (Factor E); trampling by humans on or near trails (Factor E); erosion (Factor E); fire (Factor E); military training activities (Factor E); and stochastic extinction due to small population numbers (J. Lau, Hawaii Biodiversity and Mapping Program, pers. comm. 2006; U.S. Army 2004, 2005 and 2006a; USFWS 1991, 1998, and 2003).

Sanicula mariversa is scheduled to be managed by the U.S. Army in Makua Valley, Keaau Valley, and at the seaward site in Makaha Valley. It is believed that feral goats have been eradicated from *S. mariversa*'s habitat along the southern edge of Makua Valley (U.S. Army 2006a). Genetic material will be collected from the plants at the inland site in Makaha Valley for long-term storage.

The U.S. Army is addressing the threat from small number of populations and small population sizes through partnering with many organizations and agencies to propagate this species for re-introduction and genetic storage (U.S. Army 2006b; Makua Implementation Team 2003).

The stabilization and recovery goals for this species have not been met, as only 18 mature individuals are known in the wild and not all threats are being managed. Therefore, *Sanicula mariversa* meets the definition of endangered as it remains in danger of extinction throughout its range.

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:

- Develop population monitoring methods for *Sanicula mariversa*.
- Fence remaining populations for short-term protection from ungulates.
- Reintroduce individuals into suitable habitat within historical range that is being managed for the known threats to this species.
- Study *Sanicula mariversa* populations with regard to population size and structure, geographical distribution, flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, limiting factors and threats.

5.0 REFERENCES:

Makua Implementation Team. 2003. Implementation plan for the Makua Military Reservation, island of Oahu. Unpublished.

[U.S. Army] U.S. Army Garrison, Hawaii. 2004. 2004 Status update, Implementation Plan, Makua Military Reservation, island of Oahu. Unpublished.

[U.S. Army] U.S. Army Garrison, Hawaii. 2005. 2005 Status report, Makua Implementation Plan, island of Oahu. Unpublished.

[U.S. Army] U.S. Army Garrison, Hawaii. 2006a. 2006 Status reports for the Makua implementation plan, island of Oahu. Unpublished.

[U.S. Army] U.S. Army Garrison, Hawaii. 2006b. Rare Plant database. Unpublished.

[USFWS] U.S. Fish and Wildlife Service. 2003. Endangered and threatened wildlife and plants: final designation or nondesignation of critical habitat for 101 plant species from the island of Oahu, HI: final rule. Federal Register 68(116):35949-35998.

[USFWS] U.S. Fish and Wildlife Service. 1998. Recovery plan for the Oahu plants, Portland, Oregon. 130+ pages.

[USFWS] U.S. Fish and Wildlife Service. 1991 Determination of endangered for 26 plants from the Waianae Mountains, island of Oahu, Hawaii, final rule. Federal Register 56(209):55770-55786.

Personal and Written Communications:

Lau, Joel Q.C.. 2006. Botanical Specialist, Hawaii Biodiversity and Mapping Program. Personal communication, 2006.

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U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW of *Sanicula mariversa* (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:

Marilet A. Zablan, Recovery Program Leader and Acting Assistant Field Supervisor for Endangered Species, July 2, 2007
Marie Bruegmann, Plant Recovery Coordinator, January 17 and July 2, 2007
Joy Hiromasa, Fish and Wildlife Biologist, May 31, 2007

Approve  Date 1/17/08
Lead Field Supervisor, Fish and Wildlife Service