

*Silene alexandri*  
(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: *Silene alexandri* (No common name)

## TABLE OF CONTENTS

<b>1.0</b>	<b>GENERAL INFORMATION</b> .....	<b>1</b>
1.1	Reviewers.....	1
1.2	Methodology used to complete the review.....	1
1.3	Background.....	1
<b>2.0</b>	<b>REVIEW ANALYSIS</b> .....	<b>2</b>
2.1	Application of the 1996 Distinct Population Segment (DPS) policy.....	2
2.2	Recovery Criteria.....	3
2.3	Updated Information and Current Species Status.....	4
2.4	Synthesis.....	6
<b>3.0</b>	<b>RESULTS</b> .....	<b>7</b>
3.1	Recommended Classification.....	7
3.2	New Recovery Priority Number.....	8
3.3	Listing and Reclassification Priority Number.....	8
<b>4.0</b>	<b>RECOMMENDATIONS FOR FUTURE ACTIONS</b> .....	<b>8</b>
<b>5.0</b>	<b>REFERENCES</b> .....	<b>8</b>
	Signature Page.....	10

**5-YEAR REVIEW**  
***Silene alexandri* (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 National Tropical Botanical Garden provided most of the updated information on the current status of *Silene alexandri*. 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. 1992. Determination of endangered or threatened status for 16 plants from the island of Molokai, Hawaii; final rule. Federal Register 57(196):46325-46340.

**Date listed:** October 8, 1992

**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 42 plant species from the island of Molokai, HI: final rule. Federal Register 68(52):12982-13141.

Critical habitat was designated for *Silene alexandri* in two units totaling 874 hectares (2,159 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 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 Molokai plant cluster. 1996. U.S. Fish and Wildlife Service, Portland, Oregon. 143 pages.

**Date issued:** September 26, 1996

**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?**

*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 Molokai plant cluster (USFWS 1996), based on whether the species is an annual, a short-lived perennial (fewer than ten years), or a long-lived perennial. *Silene alexandri* 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* (off-site) collection. In addition, a minimum of three populations should be documented on Molokai, and if possible, at least one other where the species now occurs or occurred historically. 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 *Silene alexandri* should be documented on Molokai and at least one other island where it now occurs 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 *Silene alexandri* should be documented on Molokai and at least one other island where it now occurs 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 I.C.5 ("Associated Rulemakings") and in section II.D ("Synthesis") below, which also includes any new information about the status and threats of the species.

**Status of *Silene alexandri* from listing through 5-year review.**

<b>Date</b>	<b>No. wild inds</b>	<b>No. outplanted</b>	<b>Stability Criteria</b>	<b>Stability Criteria Completed?</b>
1992 – listing	Fewer than 10	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
1996 – recovery plan	35	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2003 – critical habitat	0	0	All threats managed in all 3 populations	No
			Complete genetic storage	Yes
			3 populations with 50 mature individuals each	No
2007 – 5-yr review	6	0	All threats managed	Partially
			Complete genetic storage	No
			3 pops 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**

The species was described by Hillebrand (1888) as endemic to the island of Molokai. *Silene alexandri* is historically known from two populations with fewer than ten plants each (Perlman 2006). Currently, only one population totaling six individuals is known (Wood *et al.* 2002).

*Silene alexandri* occurs in a *Metrosideros – Dodonaea – Leptecophylla* (ohia lehua/aalii/pukiawe) lowland mesic shrubland. Plants grow on steep, 310 degrees, north facing, basalt walls near the gulch bottom at 838 meters (2,750 meters) of elevation (Perlman 2006).

The main threats to this species have been habitat degradation by feral goats (Factors A and D); habitat degradation by and competition with invasive introduced plant species such as *Lantana camara* (lantana), *Melinis minutiflora* (molasses grass), and *Rhyncelytrum repens* (Natal grass) (Factor E); and the loss of reproductive vigor as the result of limited numbers of existing individuals (Factor E) (Wood *et al.* 2002; Perlman 2006). The possibilities of fire, landslides or other stochastic events particularly threaten the species because its numbers are so low, with only one known

population (Factor E) (Perlman 2006; Tangalin 2006). Goats are the most likely factor in the demise of the Makolelau population and they were observed browsing at the East Kawela location at the time of the February, 2006 visit. One of the six *Silene alexandri* plants had been browsed (Factor C) (Perlman 2006).

Seed collections from 1992, 1993, and 1997 are banked at National Tropical Botanical Garden, and were distributed to Harold L. Lyon Arboretum tissue culture lab (Harold L. Lyon Arboretum Micropropagation Laboratory 2006; A. Yoshinaga, Center for Conservation Research and Training, University of Hawaii at Manoa, pers. comm. 2006; National Tropical Botanical Garden 2006). The one plant known to be in cultivation from these collections died. Another botanist with expertise with Caryophyllaceae had no success growing this species and seeds died of damping off (S. Weller, University of California, Irvine, pers. comm. 2006).

On March 7, 2006, seed was collected from three of the six plants found downstream from the earlier collection on cliffs in 1997 (Perlman 2006; N. Tangalin, National Tropical Botanical Garden, pers. comm. 2006). Seed was sent to the National Tropical Botanical Garden and the National Park Service, Kaluapapa, Molokai, and will be sent to Lyon Arboretum (N. Tangalin, pers. comm. 2006). Some seed has been sown at National Tropical Botanical Garden Nursery, with only one seed germinating to date. This plant was flowering in the National Tropical Botanical Garden greenhouse in March 2007, and will hopefully set viable seed (M. Clark, National Tropical Botanical Garden, pers. comm. 2007).

The East Molokai Watershed Partnership fenced a 4.5-kilometer (2.8-mile) portion of the Kawela area. The last section the fence, which includes Makolelau, will be fenced after permission is granted from the landowner, and will cover 1.2 kilometers (0.7 miles). Recent hunting removed a total of 43 goats from Kawela (East Molokai Watershed Partnership 2006).

The Nature Conservancy is developing a weed management plan for the East Molokai Watershed Partnership, which may address some of the invasive species impacting *Silene alexandri* (East Molokai Watershed Partnership 2006).

The stabilization and recovery goals for this species have not been met, as only six individuals are known. Therefore, *Silene alexandri* 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  
X 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 seed collection for *ex situ* genetic storage and reintroduction.
- Clone the one individual currently in cultivation for additional genetic storage.
- Fence individual plants for short-term protection from ungulates.
- Control introduced invasive plant species around remaining plants.
- Survey for populations in known historical sites and other areas of suitable habitat.
- Augment populations as plants become available in nurseries and threats are controlled at the wild populations.
- Reintroduce individuals into suitable habitat within historical range that is being managed for known threats to this species.

**5.0 REFERENCES:**

East Molokai Watershed Partnership. 2006. 1<sup>st</sup> Quarter status report. Unpublished.

Harold L. Lyon Arboretum Micropropagation Laboratory. 2006. Report on controlled propagation of species, as designated under the U.S. Endangered Species Act. Unpublished.

Hillebrand, W. 1888. Flora of the Hawaiian Islands: a description of their phanerogams and vascular cryptogams. (Facsimile of the edition, 1965) Hafner Publication Company, New York and London. Pages 27-29.

- National Tropical Botanical Garden. 2006. Report on controlled propagation of species, as designated under the U.S. Endangered Species Act. Unpublished.
- Perlman, S. 2006. National Tropical Botanical Garden, field log summaries from 1992 through 2006, compiled June, 2006. Unpublished.
- Tangalin, N. 2006. National Tropical Botanical Garden, field log summaries. Unpublished.
- [USFWS] U.S. Fish and Wildlife Service. 2003. Endangered and threatened wildlife and plants: final designation or nondesignation of critical habitat for 42 plant species from the island of Molokai, HI: final rule. Federal Register 68(52):12982-13141.
- [USFWS] U.S. Fish and Wildlife Service. 1996. Recovery plan for the Molokai plant cluster. U.S. Fish and Wildlife Service, Portland, Oregon. 143 pages.
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- Wood, K., M.H. Chapin, S. Perlman and M. Maunder. 2002. Critically endangered Hawaiian plant taxa and conservation collections within the Genetic Safety Net (GSN). Unpublished.

**Personal and Written Communications:**

- Clark, Margaret, National Tropical Botanical Garden, personal communication, e-mail, March 6, 2007.
- Tangalin, Natalia, Field Botanist, National Tropical Botanical Garden, May 3, 2006.
- Yoshinaga, Alvin, Center for Conservation Research and Training, University of Hawaii at Manoa, personal communication, e-mail, April 21, 2006.
- Weller, Steve, Botany Department, University of California, Irvine, personal communication, e-mail, April 25, 2006.

**Signature Page**  
**U.S. FISH AND WILDLIFE SERVICE**  
5-YEAR REVIEW of *Silene alexandri* (No common name)

**Current Classification:** \_\_\_\_\_ E \_\_\_\_\_

**Recommendation resulting from the 5-Year Review:**

- \_\_\_\_\_ Downlist to Threatened
- \_\_\_\_\_ Uplist to Endangered
- \_\_\_\_\_ Delist
- X  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, June 24, 2007

Marie Brueggmann, Plant Recovery Coordinator, March 26, April 2 and 9, May 24, and June 29, 2007

Christian Torres-Santana, Fish and Wildlife Biologist, March 23, April 4, and June 29, 2007

Approve Patik E d Date 1/10/08  
Lead Field Supervisor, Fish and Wildlife Service