

## **5-YEAR REVIEW**

Short Form Summary

**Species Reviewed:** *Lobelia monostachya* (no common name)

**Current Classification:** Endangered

### **Federal Register Notice announcing initiation of this review:**

[USFWS] U.S. Fish and Wildlife Service. 2010. Endangered and threatened wildlife and plants; initiation of 5-year status reviews of 58 species in Washington, Oregon, California, and Hawaii. Federal Register 75(226):71726-71729.

### **Lead Region/Field Office:**

Region 1/Pacific Islands Fish and Wildlife Office (PIFWO), Honolulu, Hawaii

### **Name of Reviewer(s):**

Chelsie Javar, Plant Biologist, PIFWO

Daniel Clark, Oahu, Kauai, Northwest Hawaiian and American Samoa Islands Team  
Manager, PIFWO

Marie Bruegmann, Plant Recovery Coordinator, PIFWO

Recovery Program Lead, PIFWO

Kristi Young, Programmatic Deputy Field Supervisor, PIFWO

### **Methodology used to complete this 5-year 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 January 31, 2012. The review was based on a review of current, available information since the last 5-year review for *Lobelia monostachya* (USFWS 2008). The National Tropical Botanical Garden provided an initial draft of portions of the 5-year review and recommendations for conservation actions needed prior to the next 5-year review. The document was reviewed by the Plant Biologist, Island Team Manager, and Plant Recovery Coordinator, followed by the Recovery Program Lead. It was subsequently reviewed and approved by the Programmatic Deputy Field Supervisor before submission to the Field Supervisor for approval.

### **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 ([http://ecos.fws.gov/tess\\_public](http://ecos.fws.gov/tess_public)).

### **Review Analysis:**

Please refer to the previous 5-year review for *Lobelia monostachya* published on January 8, 2008 (available at [http://ecos.fws.gov/docs/five\\_year\\_review/doc1847.pdf](http://ecos.fws.gov/docs/five_year_review/doc1847.pdf)) and the recovery plan for the Oahu plants (USFWS 1998), for a complete review of the species' status, threats, and management efforts. No significant new information regarding the species' biological status have come to light since listing to warrant a change in the Federal listing status of *Lobelia monostachya*.

This short-lived shrub is endangered and occurs on the island of Oahu (USFWS 1998). The current status and trends for *Lobelia monostachya* are provided in the tables below.

**New status information:**

In 2008, the population located at Wailupe Valley contained 10 mature healthy individuals. During the same year, the second population located at Waialae Nui Ridge consisted of a single mature and two immature individuals. None of the individuals observed at these locations contained mature fruit at the time (Perlman 2012).

Three additional individuals were found in Wailupe Valley, bringing the current number of naturally occurring individuals up from eight reported in the last five-year reviews to 13 (Plant Extinction Prevention Program [PEPP] 2012b).

**New threats:**

- Climate change - 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 (PICCC) funded climate modeling that will help resolve these spatial limitations. High spatial resolution climate outputs are expected to be available sometime in 2013.
- Drought - Drought is considered a threat at both Wailupe and Waialae Nui Ridge populations (Oahu PEPP 2012).
- Rodent predation or herbivory - Rats (*Rattus* sp.) are also considered a threat to *Lobelia monostachya* (Oahu PEPP 2012).

**New management actions:**

- Captive propagation for genetic storage and reintroduction
  - The Harold L. Lyon Arboretum (2012) has 24,874 seeds in seed storage from collections made by staff from the Oahu PEPP from 2005 through 2008 and 245 individuals in micropropagation storage.
  - In 2010, the Pahole Rare Plant Facility had two individuals in their nursery (Pahole Rare Plant Facility 2010). By 2012, the PEPP reported that Pahole had four seedlings and a single mature individual in their nursery (Oahu PEPP 2012).
  - In the summer of 2012, pollination was attempted between greenhouse and naturally occurring individuals to increase seed set for collection, but it is too early to report any results (PEPP 2012b).
- Reintroduction / translocation implementation - From 2007 to 2010, staff from the Oahu PEPP reintroduced 16 new individuals to Kulepeamoia-Kupaua and Hawaii Loa. Three individuals survived as of 2012 at Kulepeamoia-Kupaua. Of the five individuals reintroduced at Hawaii Loa, only a single individual survived as of 2012 (PEPP 2010, 2011; Oahu PEPP 2012).
- Population monitoring - In 2010, 2011, and 2012, staff from the Oahu PEPP monitored the natural population at Waialae Nui and the reintroduced population at Kupaua (PEPP 2010, 2011, 2012a).

**Synthesis:**

Stabilizing, downlisting, and delisting objectives are provided in the recovery plan for the 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. *Lobelia monostachya* is a short-lived perennial, and to be considered stable, threats to the taxon must be managed (e.g., fenced,) and the taxon must 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 the island of Oahu 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.

The interim stabilization goals for this species have not been met, as currently none of the two wild (natural) populations contain 50 or more mature individuals (Table 1) and all threats are not being sufficiently managed throughout all of the populations (Table 2). Therefore, *Lobelia monostachya* meets the definition of endangered as it remains in danger of extinction throughout its range.

#### **Recommendations for Future Actions:**

- Captive propagation for genetic storage and reintroduction
  - Continue to collect seeds from tagged individuals, keeping close track of the maternal source for use in *ex situ* propagation.
  - Continue to collect seeds from all existing populations and send to at least two or three different venues for propagation.
- Reintroduction / translocation - Continue to reintroduce the species back into its known historical range.
- Ecosystem-altering invasive plant species control - Control invasive introduced plant species around all populations.
- Surveys / inventories - Continue to conduct thorough surveys of all suitable habitats where *Lobelia monostachya* was historically seen.
- Threats research
  - Assess the modeled effects of climate change on this species, and use results to determine future landscape needed for the recovery of the species.
  - Explore measures to mitigate the effects of drought.
- Population viability monitoring Study populations of *Lobelia monostachya* with regard to population size and structure, geographical distribution, flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, limiting factors, and threats.
- Alliance and partnership development - Initiate planning and contribute to implementation of ecosystem-level management and restoration to benefit this species.

**Table 1. Status of *Lobelia monostachya* from listing through current 5-year review.**

<b>Date</b>	<b>No. wild indivs</b>	<b>No. outplanted</b>	<b>Stabilization Criteria identified in Recovery Plan</b>	<b>Stabilization Criteria Completed?</b>
1996 (listing)	8	0	All threats managed in 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
1998 (recovery plan)	8	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2003 (critical habitat)	3	0	All threats managed in 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2008 (5-yr review)	8	16	All threats managed in 3 populations	Partially
			Complete genetic storage	Yes
			3 populations with 50 mature individuals each	No
2013 (5-yr review)	13	4	All threats managed in 3 populations	Partially (Table 2)
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No

**Table 2. Threats to *Lobelia monostachya* and ongoing conservation efforts.**

<b>Threat</b>	<b>Listing factor</b>	<b>Current Status</b>	<b>Conservation/ Management Efforts</b>
Landslides, flooding and drought	A, E	Ongoing	No
Established ecosystem-altering invasive plant species degradation of habitat	A, E	Ongoing	No
Rodent predation or herbivory – Rats	C	Ongoing	No
Low numbers	E	Ongoing	Partially: Captive propagation for genetic storage, reintroduction and monitoring (Plant Extinction Prevention Program 2012a)
Climate change	A, E	Increasing	No

**References:**

See previous 5-year review for a full list of references (USFWS 2008). Only references for new information are provided below.

Harold L. Lyon Arboretum. 2012. Micropropagation and seed storage databases. University of Hawaii at Manoa, Honolulu, Hawaii. Unpublished.

[Oahu PEPP] Oahu Plant Extinction Prevention Program. 2012. Plant extinction prevention program reports, *Lobelia monostachya*. 1 page. Unpublished.

Pahole Rare Plant Facility. 2010. Report on controlled propagation of listed and candidate species, as designated under the U.S. Endangered Species Act. 15 pages. Unpublished.

Perlman, S. 2012. 5-year reviews information. National Tropical Botanical Garden, Kalaheo, Hawaii. 2 pages. Unpublished.

Plant Extinction Prevention Program. 2010. Plant Extinction Prevention Program annual report, fiscal year 2010 (July 1, 2009-June 30, 2010). 122 pages. Unpublished.

Plant Extinction Prevention Program. 2011. Plant Extinction Prevention Program annual report, fiscal year 2011 (July 1, 2010-June 30, 2011). 200 pages. Unpublished.

Plant Extinction Prevention Program. 2012a. Plant Extinction Prevention Program Progress Report. July 2011-Dec. 2011. Prepared for U.S. Fish and Wildlife Service and Hawaii Division of Forestry and Wildlife. Unpublished.

Plant Extinction Prevention Program. 2012b. Plant Extinction Prevention Program annual report, fiscal year 2012 (July 1, 2011-June 30, 2012). 169 pages. Unpublished.

[USFWS] U.S. Fish and Wildlife Service. 1998. Recovery plan for Oahu plants. U.S. Fish and Wildlife Service, Portland, Oregon. 207 pages + appendices. Available online at <<http://www.fws.gov/pacificislands/recoveryplans.html>>.

[USFWS] U.S. Fish and Wildlife Service. 2008. *Lobelia monostachya* (no common name) 5-year review summary and evaluation. U.S. Fish and Wildlife Service, Honolulu, Hawaii. 5 pages. Available online at <[http://ecos.fws.gov/docs/five\\_year\\_review/doc1847.pdf](http://ecos.fws.gov/docs/five_year_review/doc1847.pdf)>.

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

SIGNATURE PAGE for 5-YEAR REVIEW of *Lobelia monostachya* (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: \_\_\_\_\_

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Date *2013-08-05*