5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Labordia triflora* (Kamakahala)

Current Classification: Endangered

FR Notice announcing initiation of this review:

U.S. Fish and Wildlife Service (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.

Lead Region/Field Office:

Region 1

Pacific Islands Fish and Wildlife Office, Gina Shultz, Assistant Field Supervisor Endangered Species

Name of Reviewer(s):

Marie Bruegmann, Pacific Islands Fish and Wildlife Office, Plant Recovery Coordinator
Marilet A. Zablan, Pacific Islands Fish and Wildlife Office, Recovery Program Leader and Acting Assistant Field Supervisor for Endangered Species

Methodology used to complete this 5-year review:

This review was based on the final critical habitat designation for *Labordia triflora* and other species from the island of Molokai, as well as a review of current, available information. The National Tropical Botanical Garden, subcontracted by the Hawaii Biodiversity and Mapping Program, provided an initial draft of portions of the 5-year review.

Background:

For information regarding the species listing history and other facts, please refer to the Threatened and Endangered Species System (TESS) which is part of the Fish and Wildlife Service's Environmental Conservation On-line System (ECOS) database.

Application of the 1996 Distinct Population Segment (DPS) Policy:

This Policy does not apply to plants.

Review Analysis:

Please refer to the final critical habitat designation for *Labordia triflora* published in the Federal Register on March 18, 2003 (USFWS 2003) for a complete review of the species' status (including biology and habitat), threats, and management efforts. No new threats and 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 *L. triflora.*

Until 1990, *Labordia triflora* was known only from the type collection at Mapulehu Valley on southwestern Molokai, and was believed to be extinct. It was rediscovered in 1990, in Kua Gulch on Molokai. Currently, four sub-populations

are known from the mesic forests of the Kua-Wawaia-Kumueli region and Manuwai Gulch. Eleven individuals are currently known: four individuals in Kua gulch at approximately 2,625 feet (800 meters) elevation; three individuals along the stream banks of Wawaia between 2625 and 3,280 feet (800 and 1,000) meters; one mature individual at Manuwai Gulch; and three individuals on the slopes of Kumueli between 2, 789 and 3,117 feet (850 to 950 meters) (Maui Nui Plant Extinction Prevention Program 2006, Wood and Perlman 2002).

Labordia species are obligate outcrossers in their reproduction. When rediscovered in 1990, of eight individuals six were male, and only two were female. The sexual makeup of the current individuals is not known, and the danger of losing reproductive viability remains high with this low number of plants (Motley 1995).

The major threats to *Labordia triflora* include habitat degradation and predation by pigs (*Sus scrofa*), goats (*Capra hircus*), and deer (*Axis axis*) (Factors A and D), which probably also hinder regeneration (Factor E); predation by rats (Factor C); habitat degradation by and competition from invasive introduced plant species, including *Ageratum conyzoides* (maile kula), *Ageratina riparia* (spreading mist flower), *Axonopus fissifolius* (narrow-leaved carpetgrass), *Buddleia asiatica* (butterfly bush), *Drymaria cordata* (pipili), *Hypochoeris radicata* (hairy cat's-ear) *Lantana camara* (lantana), *Pluchea carolinensis* (sourbush), *Rubus rosifolius* (thimbleberry), *Sacciolepis indica* (Glenwood grass), *Schinus terebinthifolius* (Christmasberry), *Setaria parvula* (yellow foxtail), and *Christella dentata* (paii iha); and lack of seedling establishment in the wild (Factor E) (Maui Nui Plant Extinction Prevention Program 2006, Wood and Perlman 2002; USFWS 1999; Motley 1995).

In addition to all of the other threats, species like *Labordia triflora* that are endemic to small portions of a single island are inherently more vulnerable to extinction than widespread species because of the higher risks posed to a few populations and individuals by random demographic fluctuations and localized catastrophes such as hurricanes and disease outbreaks (Factor E). When considered on their own, the natural processes associated with being a single island endemic do not affect *L. triflora* to such a degree that it is threatened or endangered with extinction in the foreseeable future, but these natural processes can exacerbate the threat from anthropogenic factors, such as habitat loss for human development or predation by alien species (Factor E) (USFWS 2002).

Monitoring and seed collection for propagation are ongoing (Maui Nui Plant Extinction Prevention 2006; H. Oppenheimer, Plant Extinction Prevention Program, pers comm. 2007). National Tropical Botanical Garden currently has a flat of seedlings, and has already sent four plants to the Kalaupapa restoration team on Molokai (National Tropical Botanical Garden 2007a and b). Over 600 seeds are in storage (National Tropical Botanical Garden 2007a and b; Harold L. Lyon Arboretum Micropropagation Laboratory 2007; Center for Conservation and Research Training Seed Storage Laboratory 2007). Additional material from National Tropical Botanical Garden will be taken to Molokai for outplanting in a fenced exclosure within the East Molokai Watershed Partnership, as

soon as the plants are large enough (Maui Nui Plant Extinction Prevention Program 2007).

Stabilizing, downlisting, and delisting objectives are provided in the addendum to the recovery plan for multi-island plants (USFWS 2002), based on whether the species is an annual, a short-lived perennial (fewer than 10 years), or a long-lived perennial. *Labordia triflora* 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 Molokai. Each of these populations must be naturally reproducing and increasing in number, with a minimum of 50 mature individuals per population.

The stabilization goals for this species have not been met (see Table 1). Therefore, *Labordia triflora* meets the definition of endangered as it remains in danger of extinction throughout its range.

Recommendations for Future Actions:

- Collect fruit from remaining known wild individuals.
- Fence the remaining population of *Labordia triflora* to protect against feral ungulates.
- Control invasive introduced plant species around remaining individuals.
- Control rats around remaining individuals.
- Reintroduce material into protected suitable habitat within historical range of the species.
- Study *Labordia triflora* 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.

References:

Center for Conservation and Research Training Seed Storage Laboratory. 2007. Database Unpublished.

Harold L. Lyon Arboretum Micropropagation Laboratory. 2007. Database. Unpublished.

Maui Nui Plant Extinction Prevention Program. 2007. Plant Extinction Prevention Program of Maui Nui. Progress report for the period 2006.07.01 through

2007.06.30. Prepared for U.S. Fish and Wildlife Service and Hawaii Division of Forestry and Wildlife. Unpublished.

Maui Nui Plant Extinction Prevention Program. 2006. Database. Unpublished.

Motley, T.J. 1995. Rediscovery of *Labordia triflora* (Loganiaceae). Pacific Science 49(3):221-226.

National Tropical Botanical Garden. 2007a. Report on controlled propagation of species, as designated under the U.S. Endangered Species Act. Unpublished.

National Tropical Botanical Garden. 2007b. Living Collections Database. Available online at http://ntbg.org/conservation/database.php.

[USFWS] U.S. Fish and Wildlife Service. 2003. Endangered and threatened wildlife and plants; designation of critical habitat for 42 plant species from the island of Molokai, HI; final rule. 50 CFR Part 17, Federal Register 68(52)12982-13141.

[USFWS] U.S. Fish and Wildlife Service. 2002. Addendum to the recovery plan for the multi-island plants. U.S. Fish and Wildlife Service, Portland, OR. viii + 125 pages.

[USFWS] U.S. Fish and Wildlife Service. 1999. Endangered and threatened wildlife and plants; determination of endangered of threatened status for 10 plants from Maui Nui, HI. Federal Register 64(171):48309-48324.

Wood, K. R. and S. Perlman. 2002. National Tropical Botanical Garden, Department of Conservation. Personal observations of the Kumueli-Wawaia Region, Moloka`i, Hawai`i, including a checklist of vascular plants. Special report prepared for The Nature Conservancy of Hawai`i. Unpublished.

Personal Communication:

Oppenheimer, Hank. 2007. Island Coordinator, Maui Nui Plant Extinction Prevention Program. Email to National Tropical Botanical Garden, July 19, 2007.

Table 1. Status of *Labordia triflora* from listing through 5-year review.

Date	No. wild indivs	No. outplanted	Stability Criteria identified in Recovery Plan	Stability Criteria Completed?
1999 – listing	10	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partial
			3 populations with 50 mature individuals each	No
2002 – recovery plan	10	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partial
			3 populations with 50 mature individuals each	No
2003 – critical habitat	10	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partial
			3 populations with 50 mature individuals each	No
2007 – 5-yr review	11	0	All threats managed	No
			Complete genetic storage	Partial
			3 populations with 50 mature individuals each	No

U.S. FISH AND WILDLIFE SERVICE
SIGNATURE PAGE for 5-YEAR REVIEW on *Labordia triflora*

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
X No Change in listing status

Field Supervisor, Fish and Wildlife Service

Approve [signature] Date 1/18/08