

5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Acaena exigua* (liliwai)

Current Classification: Endangered

Federal Register Notice announcing initiation of this review:

[USFWS] U.S. Fish and Wildlife Service. 2012. Endangered and threatened wildlife and plants; 5-year status reviews of 46 species in Idaho, Oregon, Washington, Nevada, Montana, Hawaii, Guam, and the Northern Mariana Islands. Federal Register 77(44):13248-13251.

Lead Region/Field Office:

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

Name of Reviewer(s):

Ann Marie Gawel, Plant Biologist, PIFWO

Chelsie Javar-Salas, Plant Biologist, PIFWO

Maui nui and Hawaii Island 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 March 6, 2012. The review was based on a review of current, available information since the last 5-year review for *Acaena exigua* (USFWS 2009). The evaluation by Ann Marie Gawel and Chelsie Javar-Salas, both Plant Biologists, were reviewed by the 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.

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).

Review Analysis:

Please refer to the previous 5-year review for *Acaena exigua* published on July 29, 2009 (http://ecos.fws.gov/docs/five_year_review/doc2525.pdf) for a complete review of the species' status, threats, and management efforts. No significant new information regarding the species' biological status has come to light since listing to warrant a change in the Federal listing status of *A. exigua*.

This short-lived shrub is endangered with no currently known individuals (USFWS 1997, 2009). Historically, *Acaena exigua* was found in the wet montane bogs on Maui and Kauai. The current status and trends for *A. exigua* are provided in the tables below.

New threats:

- Climate change destruction or degradation of habitat – Climate change may pose a threat to this species. Fortini *et al.* (2013) conducted a landscape-based assessment of climate change vulnerability for native plants of Hawaii using high resolution climate change projections. Climate change vulnerability is defined as the relative inability of a species to display the possible responses necessary for persistence under climate change. The assessment by Fortini *et al.* (2013) concluded that *Acaena exigua* is highly vulnerable to the impacts of climate change. Therefore, additional management actions are needed to conserve this taxon into the future.

New management actions:

- Ungulate monitoring and control – No permanent fences have been constructed at Puu Kukui where the species was known historically, although strategic fences have been used to take advantage of natural barriers to exclude ungulates from migrating into the Puu Kukui Watershed Preserve (Maui Land and Pineapple Company, Ltd. 2011).
- Listing and critical habitat designation – Three units of unoccupied areas of critical habitat for *Acaena exigua* were proposed in the montane wet ecosystems on Maui (USFWS 2012). The final rule for critical habitat designations has not been published at the time of this review.

Synthesis:

Stabilizing, downlisting, and delisting objectives are provided in the recovery plan for the Maui plant cluster (USFWS 1997), based on whether the species is an annual, a short-lived perennial (fewer than 10 years), or a long-lived perennial. *Acaena exigua* is a short-lived perennial, and to be considered stable, this species 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 the islands of Maui and Kauai 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 *Acaena exigua* have not been met, since no individuals are currently known to exist (Table 1). Therefore, *A. exigua* meets the definition of endangered as it remains in danger of extinction throughout its range.

Recommendations for Future Actions:

- Surveys / inventories – Survey for populations of *Acaena exigua* in areas of potentially suitable habitat.
- Captive propagation for genetic storage and reintroduction – If the species is rediscovered collect genetic material for *ex situ* storage and reintroduction.
- Threats – predator / herbivore research – If the species is rediscovered, research which threats, herbivory by introduced slugs, rodents, or disease
- Loss of mutualists – determine if pollinators are lacking, or if other limiting factors affect the survival of this species.

- Ungulate monitoring and control – Continue ungulate fencing of suitable habitat for *Acaena exigua*.
- Invasive plant monitoring and control – Eradicate invasive introduced plants and maintain *Acaena exigua* habitat free of invasive introduced plants.
- Climate change adaptation strategy – Research the suitability of habitat for reintroducing this species in the future due to the impacts of climate change.
- Alliance and partnership development – Initiate planning and contribute to implementation of ecosystem-level restoration and management to benefit this taxon.

Table 1. Status and trends of *Acaena exigua* from listing through current 5-year review.

Date	No. wild indivs	No. outplanted	Stabilization Criteria identified in Recovery Plan	Stabilization Criteria Completed?
1992 (listing)	0	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
1997 (recovery plan)	0	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2003 (critical habitat)	0	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2009 (5-yr review)	0	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2012 (critical habitat-proposed)	0	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2014 (5-yr review)	0	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No

Table 2. Threats to *Acaena exigua* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Ungulates – degradation of habitat and herbivory	A, C, D, E	Ongoing	Partially, strategic fences at Puu Kukui, where species was known historically
Invasive introduced plants	A, E	Ongoing	None
Rodent predation or herbivory – rats	C	Ongoing	None
Low numbers	E	Ongoing	None
Hiking and trail maintenance	E	Ongoing	None
Climate change	A, E	Increasing	None

References:

See previous 5-year review for a full list of references (USFWS 2009). Only references for new information are provided below.

Fortini, L., J. Price, J. Jacobi, A. Vorsino, J. Burgett, K. Brinck, F. Amidon, S. Miller, S. Gon II, G. Koob, and E. Paxton. 2013. A landscape-based assessment of climate change vulnerability for all native Hawaiian plants. Technical report HCSU-044. Hawaii Cooperative Studies Unit, University of Hawaii at Hilo, Hawaii. 141 pages.

Maui Land and Pineapple Company, Ltd. 2011. Annual progress report for Puu Kukui Watershed preserve axis deer fence project: phase I and Phase 3. Submitted to USFWS Conservation Partnerships Program, Pacific Islands Fish and Wildlife Office, Honolulu, Hawaii. Unpublished.

[USFWS] U.S. Fish and Wildlife Service. 1997. Recovery plan for the Maui plant cluster. U.S. Fish and Wildlife Service, Portland, Oregon. 130 pages + appendices.

[USFWS] U.S. Fish and Wildlife Service. 2009. *Acaena exigua* (liliwai) 5-year review summary and evaluation. Pacific Islands Fish and Wildlife Office, Honolulu, Hawaii. 13 pages.

[USFWS] U.S. Fish and Wildlife Service. 2012. Endangered and threatened wildlife and plants; listing 38 species on Molokai, Lanai, and Maui as endangered and designating critical habitat on Molokai, Lanai, Maui, and Kahoolawe for 135 species; proposed rule. Federal Register 77(112):34464-34775.

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Pre-1992 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

for Programmatic Deputy Field Supervisor, Pacific Islands Fish and Wildlife Office

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Date 2014-03-11