

5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Achyranthes mutica* (no common name)

Current Classification: Endangered

Federal Register Notice announcing initiation of this review:

[USFWS] U.S. Fish and Wildlife Service. 2007. Endangered and threatened wildlife and plants; initiation of 5-year reviews of 71 species in Oregon, Hawaii, Commonwealth of the Northern Mariana Islands, and Territory of Guam. Federal Register 72(45):10547-10550.

Lead Region/Field Office:

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

Name of Reviewer(s):

Jeff Burgett, Pacific Islands Fish and Wildlife Office, Fish and Wildlife Biologist
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 conducted by staff of the Pacific Islands Fish and Wildlife Office (PIFWO) of the U.S. Fish and Wildlife Service (USFWS) beginning on March 8, 2007. The review was based on the final critical habitat designations for *Achyranthes mutica* and other species from the islands of Hawaii and Kauai, as well as a review of current, available information (USFWS 2003). The Bernice P. Bishop Museum provided an initial draft of portions of the 5-year review and they also provided recommendations for conservation actions needed prior to the next five-year review. The evaluation of the status of the species was prepared by the lead PIFWO biologist and reviewed by the Plant Recovery. The document was then reviewed by the Recovery Program Leader and acting Assistant Field Supervisor for Endangered Species 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).

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

This Policy does not apply to plants.

Review Analysis:

Please refer to the recovery plan for *Achyranthes mutica* and other multi-island species (USFWS 1999) 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 *A. mutica*.

At the time of listing, only one population of *Achyranthes mutica*, with a total of 20 to 50 individuals, was known from the Kohala Mountains on the island of Hawaii (USFWS 1996). In 1999, two additional populations had been located but the total number of individuals remained 20 to 50 (USFWS 1999). The number of wild individuals continues to decline, and the three populations on Hawaii contain a total of 38 individuals at this time: six individuals in Lanikepu Gulch, 28 individuals at Kalopi and the adjacent Queen Emma Foundation property, and four individuals at Puuloa (Plant Extinction Prevention Program 2007, 2008; USFWS 2008). The taxon remains extirpated from the wild on Kauai (K. Wood, pers comm., 2008).

The major threats to *Achyranthes mutica* are degradation and loss of habitat by cattle (*Bos taurus*), feral pigs (*Sus scrofa*) and feral goats (*Capra hircus*) (Factors A and D). The Kalopi and Puuloa populations are protected from effects of cattle and pigs by a fence that surrounds the population, but that does not completely prevent browsing by goats. Another major threat is competition for light, space and water resources from invasive introduced plant species (Factor E). The species most clearly threatening *A. mutica* include *Lantana camara* (lantana), *Schinus terebinthifolius* (Christmasberry), and *Pennisetum clandestinum* (kikuyu grass) (Plant Extinction Prevention Program 2007; USFWS 2008).

Human activities and fire (Factor E) potentially threaten the survival of the remaining populations (Plant Extinction Prevention Program 2007; USFWS 2007). There is a high risk of fire at Puuloa, and fire is a potential threat at Lanikepu. The Puuloa population is close to forestry development, which may have an impact on the population through habitat loss and degradation. There is a substantial risk from increased visitation, which could seriously impact the species due to low population and individual numbers (USFWS 1996b, 1999).

In addition to the above-mentioned threats, species like *Achyranthes mutica* that are confined to small portions of a single island are inherently more vulnerable to extinction than are widespread species because of the higher risks posed to a few populations and individuals by random demographic fluctuations and localized catastrophes such as hurricanes, landslides, flooding and disease outbreaks (Factor E) (USFWS 1998).

Volcano Rare Plant Facility (2008) has 1,000 seeds from the Kalopi population, and seven individuals in the nursery from all three populations. National Tropical Botanical Garden (2008) has 1,800 seeds in storage. Active outplanting by National Tropical Botanical Garden includes a total of 138 individuals at their Kauai, Kukuiula, and Makauwahi facilities for genetic storage. However, survival was only 50 percent at

Makauwahi (Burney and Burney 2007). The University of Hawaii's Center for Conservation Research and Training (2008) has 1,059 seeds in storage. The Kalopi and Puuloa populations are surrounded by enclosure fences, and invasive plant eradication is occurring in the surrounding areas of all three populations (Plant Extinction Prevention Program 2008).

Stabilizing, downlisting, and delisting objectives are provided in the recovery plan for multi-island plants (USFWS 1999), based on whether the species is an annual, a short-lived perennial (fewer than 10 years), or a long-lived perennial. *Achyranthes mutica* is a short-lived perennial, and to be considered stabilized, which is the first step in recovering the species, the 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 both Hawaii and Kauai. 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, as only 38 individuals are known and not all threats are being managed (see Table 1). Therefore, *Achyranthes mutica* meets the definition of endangered as it remains in danger of extinction throughout its range.

Recommendations for Future Actions:

- Construct protective fences around all known populations, and remove feral ungulates and non-native invasive plant species from the surrounding habitat.
- Continue to acquire and propagate genetic material for long-term *ex situ* storage, and for the establishment of new or augment existing populations in suitable habitat.
- Research of the life history and biology of the species.
- Genetic analysis to determine the variability within the extant wild individuals

References:

Burney, D. A., and L. P. Burney. 2007. Paleoecology and "inter-situ" restoration on Kauai, Hawaii. *Frontiers in Ecology and Environment* 5:483-490.

Center for Conservation Research and Training Seed Storage Facility. 2008. Seed conservation lab database. University of Hawaii at Manoa, Honolulu, Hawaii. Unpublished.

- National Tropical Botanical Garden. 2008. Report on controlled propagation of listed and candidate species, as designated under the U.S. endangered species act. National Tropical Botanical Garden, Lawai, HI. Unpublished.
- Plant Extinction Prevention Program. 2007. Annual performance report (July 1, 2006 to June 30, 2007), Plant Extinction Prevention (PEP) program for Oahu, Maui Nui, Hawaii. Unpublished.
- Plant Extinction Prevention Program. 2008. Section 6 annual performance report for endangered plant restoration and enhancement - Plant Extinction Prevention (formerly Genetic Safety Net), Fiscal Year 2008 (July 1, 2007 – June 30, 2008). Hawaii Department of Land and Natural Resources, Division of Forestry and Wildlife. 113 pages. Unpublished.
- [USFWS] U.S. Fish and Wildlife Service. 1996. Endangered and threatened wildlife and plants; determination of endangered or threatened status for Fourteen Plant Taxa from the Hawaiian Islands. Federal Register 61:53108-53124.
- [USFWS] U.S. Fish and Wildlife Service. 1999. Recovery plan for the multi-island plants. U.S. Fish and Wildlife Service, Portland.
- [USFWS] U.S. Fish and Wildlife Service. 2008. Rare plant tracking database. Pacific Islands Fish and Wildlife Office, Honolulu, HI. Accessed on April 28, 2008. Unpublished.
- Volcano Rare Plant Facility. 2008. Report on controlled propagation of listed and candidate species, as designated under the U.S. endangered species act. Center for Plant Conservation Research and Training, Hilo, HI. Unpublished.

Table 1. Status of *Achyranthes mutica* from listing through 5-year review.

Date	No. wild individuals	No. outplanted	Stability Criteria identified in Recovery Plan	Stability Criteria Completed?
1996 (listing)	20-50	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
1999 (recovery plan)	20-50	0	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2003 (critical habitat)	20-50	0	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2008 (5-year review)	38	0	All threats managed	Partially
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No

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SIGNATURE PAGE for 5-YEAR REVIEW of *Achyranthes mutica*

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

Field Supervisor, Pacific Islands Fish and Wildlife Office



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Date 4/2/09