

5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Melicope haupuensis* (Alani)

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):

Jay Nelson, Fish and Wildlife Biologist

Marie Brueggemann, Plant Recovery Coordinator

Marilet A. Zablan, Recovery Program Leader and acting Assistant Field Supervisor for Endangered Species

Gina Shultz, Deputy Field Supervisor

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 8, 2007. The review was based on the final critical habitat designation for *Melicope haupuensis* and other species from the island of 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 recommendations for conservation actions needed prior to the next five-year review. The evaluation of the status of the species was prepared by our lead PIFWO biologist and reviewed by the Plant Recovery Coordinator. The document was then reviewed by the Recovery Program Leader and acting Assistant Field Supervisor for Endangered Species, and 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).

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 *Melicope haupuensis* published in the Federal Register on February 27, 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 *M. haupuensis*.

Herbarium vouchers at Bishop Museum (C. Imada, Bernice Pauahi Bishop Museum, pers. comm. 2008) and data from National Tropical Botanical Garden (2008) and the Hawaii Natural Heritage Program (2007) revealed flowering from March through May and August through December; fruiting specimens were noted from March through May and August through November.

First collected in 1927 but not described as a species until 1944 (St. John 1944, as *Pelea haupuensis*), *Melicope haupuensis* was long known only from the site of its original discovery on the north side of Haupu Ridge on Kauai. While this population is now believed extirpated, in 1989 two plants of this long-lived perennial tree were discovered along the banks of Koaie Stream on State-owned land in Waimea Canyon, on a different part of Kauai. At the time the species was federally listed in 1994 (USFWS 1994), those were the only two plants known. In the past ten years more plants have been discovered in the Na Pali area. The critical habitat designation for Kauai and Niihau (USFWS 2003) updated the sum to four populations with a total of 13 individuals on State-owned land within the Alakai Wilderness Preserve, Na Pali Coast State Park, and Na Pali-Kona Forest Reserve in Kalahu, Awaawapuhi Valley, and Koaie Canyon. Most recently, USFWS (2008) reported three populations totaling 30 individuals, with a population breakdown of one individual at Koaie, about 15 at Awaawapuhi, and 12 at Honopu.

National Tropical Botanical Garden (2008b) reported one plant provided to the Kokee Rare Plant Facility for reintroduction. Harold L. Lyon Arboretum (2008) has four individuals in micropropagation from one collection at Awaawapuhi.

The major threats to this species are habitat degradation by feral goats (*Sus scrofa*), deer (*Odocoileus hemionus*), and rats (*Rattus* spp.) (Factors A, C, and D); competition with invasive introduced plant species such as *Lantana camara* (lantana), *Rubus argutus* (thimbleberry), *Hedychium gardnerianum* (kahili ginger), and *Erigeron karvinskianus* (daisy fleabane) (Factor E); susceptibility to black twig borer (*Xylosandrus compactus*) damage (Factor C); naturally occurring events, such as landslides or hurricanes (Factor E); and reduced reproductive vigor due to small population size (Factor E) (USFWS 1995).

Stabilizing, downlisting, and delisting objectives are provided in the recovery plan for plants for the Kauai plants (USFWS 1995), based on whether the species is an annual, a short-lived perennial (fewer than ten years), or a long-lived perennial. *Melicope haupuensis* is a long-lived perennial, and to be considered stabilized, which is the first step in recovering the species, 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 islands where they now occur or occurred historically. Each of these populations must be naturally reproducing and increasing in number, with a minimum of 25 mature individuals per population.

Melicope haupuensis is critically endangered, with approximately 30 known wild individuals. The stabilization goals for this species have not been met, as only approximately 30 wild individuals are known and no management is occurring. Therefore, *Melicope haupuensis* meets the definition of endangered as it remains in danger of extinction throughout its range.

Recommendations for Future Actions:

- Collect fruit from all wild and any reintroduced individuals that set seed to add to the genetic diversity.
- Construct large-scale fences around all naturally occurring and reintroduced individuals to control feral ungulates.
- Enhance current natural populations to increase numbers of individuals.
- Establish populations in protected habitat within historical range.
- Survey geographical and historical range for a thorough current assessment of the species.
- Assess genetic variability within extant population.
- Initiate planning and contribute to implementation of ecosystem-level restoration and management to benefit this species.
- Study *Melicope haupuensis* 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:

Harold L. Lyon Arboretum Micropropagation Laboratory. 2008. Micropropagation database. University of Hawaii at Manoa. Unpublished.

Hawaii Biodiversity and Mapping Program. 2007. Program Database. University of Hawaii at Manoa, Honolulu, Hawaii. Unpublished.

National Tropical Botanical Garden. 2008a. Herbarium database; <http://ntbg.org/herbarium/>. Accessed 10 March 2008.

National Tropical Botanical Garden. 2008b. Report on controlled propagation of listed and candidate species, as designated under the U.S. Endangered Species Act. Unpublished.

St. John, H. 1944. Diagnoses of Hawaiian species of *Pelea* (Rutaceae). Hawaiian plant studies 13. Lloydia 7: 265-274.

[USFWS] U.S. Fish and Wildlife Service. 1994. Endangered and threatened wildlife and plants; determination of endangered or threatened status for 24 plants from the island of Kauai, HI. Federal Register 59(38):9304–9329.

[USFWS] U.S. Fish and Wildlife Service. 1995. Recovery Plan for the Kauai Plant Cluster. U. S. Fish and Wildlife Service, Portland, OR. 270 pp.

[USFWS] U.S. Fish and Wildlife Service. 2003. Endangered and threatened wildlife and plants; final designation or nondesignation of critical habitat for 95 plant species from the islands of Kauai and Niihau, HI; final rule. Federal Register 68(39):9116–9479.

[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.

Table 1. Status of *Melicope haupuensis* (Alani) from listing through 5-year review.

Date	No. wild individuals	No. outplanted	Stability Criteria identified in Recovery Plan	Stability Criteria Completed?
1994 (listing)	2	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
1995 (recovery plan)	2	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2003 (critical habitat)	13	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2008 (5-year review)	30	0	All threats managed	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	Partially

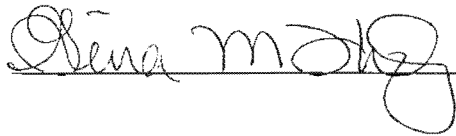
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Pre-1996 DPS listing still considered a listable entity? N/A

Recommendation resulting from the 5-year review:

<u> </u>	Delisting
<u> </u>	Reclassify from Endangered to Threatened status
<u> </u>	Reclassify from Threatened to Endangered status
<u> X </u>	No Change in listing status

Acting Field Supervisor, Pacific Islands Fish and Wildlife Office



Date 21 July 2009