5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Hibiscadelphus hualalaiensis* (Hau kuahiwi)

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 *Hibiscadelphus hualalaiensis* and other species from the island of Hawaii, 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 *Hibiscadelphus hualalaiensis* published in the Federal Register on July 2, 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 *H. hualalaiensis*.

None of the historically known wild plants still exist; the last wild plant died in 1992 (USFWS 1994). Fifty individuals have been reintroduced at Puuwaawaa Sanctuary cabin

since 1997. The oldest individuals have reproduced and there are at least ten immature individuals (J.L. Perry, Division of Forestry and Wildlife, pers. comm. 2007). All outplants flower and bear fertile fruit within three to five years. *Hibiscadelphus hualalaiensis* has also been reintroduced into other Big Island sites: about 10 trees below the highway at Puu Waawaa, an unknown number at Kaupulehu Forest Reserve, seven trees at Kaloko-Honokohau National Historical Park in 2006, and an unknown number at Makala-Ooma forest near Kaloko Mauka (J. Wagner, Kaloko-Honokohau National Historic Park, pers. comm. 2007). There is an abundance of seed from these reintroductions available every year and once planted seeds germinate and grow well (J.L. Perry, pers. comm. 2007). In total, approximately 100 individuals have been reintroduced into five separate locations. Over 1,000 seeds are in genetic storage (Volcano Rare Plant Facility 2007; Center for Conservation and Research Training Seed Storage Laboratory 2007). In addition, this species is widely available in cultivation (P. Moriyasu, Volcano Rare Plant Facility, pers. comm. 2006).

Ungulates (Factors A and D) are not currently a threat to *Hibiscadelphus hualalaiensis*, as individuals are only reintroduced into fenced areas free of ungulates. Several species of moths feed on the leaves, flowers, and mature capsules of *Hibiscadelphus* (Factor C) (Hawaii Biodiversity and Mapping Program 2005; Lorence and Wagner 1995), and the Japanese white-eye, a small naturalized bird, is a nectar robber of this genus (Factor C) (Lorence and Wagner 1995). Large-scale control methods are not yet available for the moths.

In addition to all of the other threats, species like *Hibiscadelphus hualalaiensis* 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 *H. hualalaiensis* 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 1998).

Stabilizing, downlisting, and delisting objectives are provided in the recovery plan addendum for plants from the island of Hawaii (USFWS 1998), based on whether the species is an annual, a short-lived perennial (fewer than 10 years), or a long-lived perennial. *Hibiscadelphus hualalaiensis* is a long-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 the island of Hawaii. Each of these populations must be naturally reproducing and increasing in number, with a minimum of 25 mature individuals per population.

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

Recommendations for Future Actions:

- Develop a plan for conserving the species' genetic diversity in *ex situ* collections and in reintroduced populations.
- Continue reintroducing individuals into protected suitable habitat and expand to additional locations.
- Collect fruit from any reintroduced individuals that set seed to add to the genetic diversity of the *ex situ* material.
- Study reintroduced *Hibiscadelphus hualalaiensis* 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.

Hawaii Biodiversity and Mapping Program. 2005. Program Database. Unpublished.

Lorence, D.H. and W.L.Wagner 1995. Another new, nearly extinct species of *Hibiscadelphus* (Malvaceae) from the Hawaiian Islands. Novon 5 (2):183-187.

[USFWS] U.S. Fish and Wildlife Service. 2003. Endangered and threatened wildlife and plants; final designation and nondesignation of critical habitat for 46 plant species from the island of Hawaii, HI; final rule. Federal Register 68(127):39624-39722.

[USFWS] U.S. Fish and Wildlife Service. 1998. Big Island II: addendum to the recovery plan for the Big Island plant cluster. U.S. Fish and Wildlife Service, Portland, OR. 80 pages + appendices.

[USFWS] U.S. Fish and Wildlife Service. 1996. Endangered and threatened wildlife and plants; determination of endangered status for thirteen plants from the island of Hawaii, state of Hawaii. Federal Register 61(198):53137-53153.

Volcano Rare Plant Facility. 2007. Report on controlled propagation of species, as designated under the U.S. Endangered Species Act. Unpublished.

Personal Communication:

Moriyasu, Patty. 2007. Propagator, Volcanoes Rare Plant Facility, Email to M. Bruegmann, USFWS, August 3, 2007.

Perry, J. Lyman. 2007. Botanist, Division of Forestry and Wildlife, Hawaii District, Email to M. Bruegmann, USFWS, July 16, 2007.

Wagner, Jill. 2007. Horticulturalist, Kaloko-Honokohau National Historic Park, Hawaii. Email to National Tropical Botanical Garden, August 9, 2007.

Table 1. Status of *Hibiscadelphus hualalaiensis* from listing through 5-year review.

Date	No. wild indivs	No. outplanted	Stability Criteria identified in Recovery Plan	Stability Criteria Completed?
1994 – listing	0	22	All threats managed in all 3 populations	Partial
			Complete genetic storage	Yes
			3 populations with 25 mature individuals each	No
1998 – recovery plan	0	30	All threats managed in all 3 populations	Partial
			Complete genetic storage	Yes
			3 populations with 25 mature individuals each	No
2003 – critical habitat	0	12	All threats managed in all 3 populations	Partial
			Complete genetic storage	Yes
			3 populations with 25 mature individuals each	No
2007 – 5-yr review	0	ca 100	All threats managed	Partial
			Complete genetic storage	Yes
			3 populations with 25 mature individuals each	Partial

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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 Patrick Leonard Date 1/18/05