

5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Hibiscadelphus woodii* (Hau kuahiwi)

Current Classification: Endangered

Federal Register Notice announcing initiation of this review:

[USFWS] U.S. Fish and Wildlife Service. 2010. Endangered and threatened wildlife and plants; initiation of 5-year status reviews of 69 species in Idaho, Washington, Hawaii, Guam, and the Commonwealth of the Northern Mariana Islands. Federal Register 75(67):17947-17950.

Lead Region/Field Office:

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

Name of Reviewer(s):

Chelsie Javar, Fish and Wildlife Biologist, PIFWO
Marie Bruegmann, Plant Recovery Coordinator, PIFWO
Jess Newton, Recovery Program Leader, PIFWO
Assistant Field Supervisor for Endangered Species, 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 April 8, 2010. The review was based on a review of current, available information since the last 5-year review for *Hibiscadelphus woodii* (USFWS 2007). Bernice Pauahi Bishop Museum provided an initial draft of portions of the review and recommendations for conservation actions needed prior to the next five-year review. The evaluation of Chelsie Javar, Fish and Wildlife Biologist, was reviewed by the Plant Recovery Coordinator. The document was then reviewed by the Recovery Program Leader and the 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).

Review Analysis:

Please refer to the previous 5-year review for *Hibiscadelphus woodii* published on August 2, 2007 (available at http://ecos.fws.gov/docs/five_year_review/doc1135.pdf) and the Kauai II addendum to the recovery plan for the Kauai plant cluster (USFWS 1998), for a complete review of the species' status, threats, and management efforts. No new threats or 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. woodii*.

This long-lived perennial is endangered and endemic to the island of Kauai (USFWS 1998). The current status and trends for *Hibiscadelphus woodii* are provided in the tables below.

New taxonomic information:

None reported.

New threats:

Climate change may also pose a threat to this species. However, current climate change analyses in the Pacific Islands lack sufficient spatial resolution to make predictions on impacts to this species. The Pacific Islands Climate Change Cooperative (PICCC) has currently funded climate modeling that will help resolve these spatial limitations. We anticipate high spatial resolution climate outputs by 2013.

New management actions:

- Captive propagation for genetic storage and reintroduction:
 - In 2006, the National Tropical Botanical Garden sent three cuttings of *Hibiscadelphus woodii* to the Cincinnati Zoo for propagation (National Tropical Botanical Garden 2006); this effort proved unsuccessful (Ken Wood, National Tropical Botanical Garden, pers. comm. 2011).
 - Subsequently, there have been no reports of controlled propagation efforts at the National Tropical Botanical Garden (2007, 2008, 2009, 2010), the Center for Conservation Research and Training Seed Storage Laboratory (2010) or at the Harold L. Lyon Arboretum Micropropagation Laboratory (Harold L. Lyon Arboretum 2010).

Synthesis:

In 2009 and 2010, the Plant Extinction Prevention Program (2009, 2010) reported that only a single wild individual is extant on the steep, cliffy habitat in Kalalau Valley. In 2011, Ken Wood (pers. comm. 2011) confirmed that he has not visited the single individual since 2006, and that the current status of the single extant plant is unknown.

Stabilizing, downlisting, and delisting objectives are provided in the Kauai II addendum to the recovery plan for the Kauai plant cluster (USFWS 1998), based on whether the species is an annual, a short-lived perennial (fewer than 10 years), or a long-lived perennial. *Hibiscadelphus woodii* 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 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 25 mature individuals per population.

The interim stabilization goals for this species have not been met, as currently there is only a single individual known (Table 1) and all threats are not being managed (Table 2). Therefore, *Hibiscadelphus woodii* meets the definition of endangered as it remains in danger of extinction throughout its range.

Recommendations for Future Actions:

- Captive propagation for genetic storage and reintroduction:
 - Continue to collect seeds from all existing individuals and send to at least two or three different venues for propagation.
- Reintroduction / translocation implementation – Once genetic material has been propagated, reintroduce the species back into its known historical range.
- Population viability monitoring – Monitor the condition of the single known extant individual of *Hibiscadelphus woodii*, which hasn't been visited since 2006.
- Ungulate control – Control ungulates to protect the extant individual against disturbances from feral ungulates.
- Surveys / inventories – Conduct thorough surveys of all suitable habitats where *Hibiscadelphus woodii* was historically seen.
- Ecosystem-altering invasive plant species control – Control invasive introduced plant species around the extant population.
- Captive propagation protocol development – Conduct research to develop new innovative techniques or technological advances in propagation methodology to propagate this species.
- Threats research – Conduct research on the degree of damage resulting from nectar robbing by the Japanese white-eye, with emphasis on management strategies to reduce the impacts of these birds.
- Alliance and partnership development – Work with the Hawaii Division of Forestry and Wildlife and other land managers to continue planning and contribute to implementation of ecosystem-level restoration and management to benefit this species.

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

Date	No. wild indivs	No. outplanted	Stabilization Criteria identified in Recovery Plan	Stabilization Criteria Completed?
1996 (listing)	4	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 25 mature individuals each	No
1998 (recovery plan)	4	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 25 mature individuals each	No
2003 (critical habitat)	2	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 25 mature individuals each	No
2007 (5-yr review)	1	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 25 mature individuals each	No
2012 (5-yr review)	1	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 25 mature individuals each	No

Table 2. Threats to *Hibiscadelphus woodii* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Ungulates – Degradation of habitat and herbivory	A, C	Ongoing	No
Established ecosystem-altering invasive plant species	A	Ongoing	No
Nonnative bird competition	E	Ongoing	No
Low numbers	E	Ongoing	No
Climate change	A, E	Increasing	No

References:

See previous 5-year review for a full list of references (USFWS 2007). Only references for new information are provided below.

Center for Conservation Research and Training Seed Storage Laboratory. 2010. Seed bank inventory. Honolulu, Hawaii. Microsoft Access database. Unpublished.

Harold L. Lyon Arboretum. 2010. Micropropagation database. Honolulu, Hawaii. Unpublished.

National Tropical Botanical Garden. 2006. Controlled propagation report to U.S. Fish and Wildlife Service. Kalaheo, Hawaii. Unpublished.

National Tropical Botanical Garden. 2007. Controlled propagation report to U.S. Fish and Wildlife Service. Kalaheo, Hawaii. Unpublished.

National Tropical Botanical Garden. 2008. Controlled propagation report to U.S. Fish and Wildlife Service. Kalaheo, Hawaii. Unpublished.

National Tropical Botanical Garden. 2009. Controlled propagation report to U.S. Fish and Wildlife Service. Kalaheo, Hawaii. Unpublished.

National Tropical Botanical Garden. 2010. Controlled propagation report to U.S. Fish and Wildlife Service. Kalaheo, Hawaii. Unpublished.

Plant Extinction Prevention Program. 2009. Annual report for Plant Extinction Prevention program, fiscal year 2009 (July 1, 2008-June 30, 2009). 118 pages. Unpublished.

Plant Extinction Prevention Program. 2010. Plant Extinction Prevention Program annual report, fiscal year 2010 (July 1, 2009-June 30, 2010). 122 pages. Unpublished.

[USFWS] U.S. Fish and Wildlife Service. 1998. Kauai II: Addendum to the recovery plan for the Kauai plant cluster. U.S. Fish and Wildlife Service, Portland, Oregon. 84+ pages. Available online at <<http://www.fws.gov/pacificislands/recoveryplans.html>>.

[USFWS] U.S. Fish and Wildlife Service. 2007. *Hibiscadelphus woodii* (hau kuahiwi): 5-year review; summary and evaluation. U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office, Honolulu, Hawaii. 9 pages. Available online at <http://www.fws.gov/ecos/ajax/docs/five_year_review/doc1135.pdf>.

Personal communications:

Wood, Ken R. 2011. Research biologist, National Tropical Botanical Garden, Kalaheo, Kauai. Telephone communication with Clyde Imada, Bishop Museum, dated February 8, 2011. Subject: *Hibiscadelphus woodii*.

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5-YEAR REVIEW of *Hibiscadelphus woodii* (Hau kuahiwi)

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

Appropriate Listing/Reclassification Priority Number, if applicable:

Review Conducted By:

Chelsie Javar, Fish and Wildlife Biologist
Marie Bruegmann, Plant Recovery Coordinator
Jess Newton, Endangered Species Recovery Program Leader
Assistant Field Supervisor for Endangered Species

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 Jess Newton

Date 8/28/2012