

## 5-YEAR REVIEW

### Short Form Summary

**Species Reviewed:** *Hibiscadelphus hualalaiensis* (hau kuahiwi)

**Current Classification:** Endangered

#### **Federal Register Notice announcing initiation of this review:**

[USFWS] U.S. Fish and Wildlife Service. 2013. Endangered and threatened wildlife and plants; Initiation of 5-year status reviews of 44 species in Oregon, Hawaii, Guam, and the Northern Mariana Islands. Federal Register 78(24):8185-8187.

#### **Lead Region/Field Office:**

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

#### **Name of Reviewer(s):**

Chelsie Javar-Salas, Plant Biologist, PIFWO

Marie Bruegmann, Plant Recovery Coordinator, 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 4, 2013. The review was based on a review of current, available information since the last 5-year review for *Hibiscadelphus hualalaiensis* (USFWS 2008). The evaluation by Chelsie Javar-Salas, Plant Biologist, was reviewed by the Plant Recovery Coordinator. 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 at: [http://ecos.fws.gov/tess\\_public](http://ecos.fws.gov/tess_public).

#### **Review Analysis:**

Please refer to the previous 5-year review for *Hibiscadelphus hualalaiensis* published on January 18, 2008 (available at: [http://ecos.fws.gov/docs/five\\_year\\_review/doc1840.pdf](http://ecos.fws.gov/docs/five_year_review/doc1840.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 *H. hualalaiensis*.

This long-lived perennial is endangered and endemic to Hawaii Island (USFWS 1998). *Hibiscadelphus hualalaiensis* was historically known from three populations located in the Puu Waawaa region of Hualalai. The last known wild tree was in Puu Waawaa Wildlife Sanctuary, owned and managed by the State of Hawaii Department of Land and Natural Resources, Division of Forestry and Wildlife. This tree died in 1992 (USFWS 1998), making this species extinct in the wild. The status and trends for *H. hualalaiensis* are provided in the tables below.

New status information:

- In 2010, there were two outplanted individuals on private land in South Kohala (Plant Extinction Prevention Program [PEPP] 2010). In 2012, 93 individuals of *H. hualalaiensis* were reintroduced in a Natural Area Reserve System on Hawaii Island (State of Hawaii Department of Land and Natural Resources 2012). In addition, there are two reintroduced individuals of *H. hualalaiensis* on private land in North Kona (J. Wagner, Future Forests Nursery, pers. comm. 2015).
- Overall, the numbers of individuals have decreased from the approximately 100 outplanted individuals reported in the previous 5-year review, to approximately 97 outplanted individuals in 2015.

New threats:

- Climate change destruction or degradation of habitat – 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 *Hibiscadelphus hualalaiensis* is highly vulnerable to the impacts of climate change. Furthermore, *H. hualalaiensis* was identified as a species that will have no overlapping area between current and future climate envelope (areas that contain the full range of climate conditions under which the species is known to occur) by 2100. Therefore, additional management actions are needed to conserve this taxon into the future.
- Stochastic events – Drought mortality or reduced viability – Drought may exacerbate the effects of ungulates and has direct adverse impacts on *H. hualalaiensis* (J. Wagner, pers. comm. 2015).

New management actions:

- Surveys / inventories – A survey of a reintroduced population on private land detected two individuals (PEPP 2010).
- Ungulate monitoring and control – The State of Hawaii Department of Land and Natural Resources (2012) maintained existing exclosures and monitored the exclosures for the presence of ungulates.
- Captive propagation for genetic storage and reintroduction
  - The Volcano Rare Plant Facility (2013) has more than 1,300 seeds in storage from four collections. The Facility propagated eight individuals for reintroduction at Puu Waawaa in 2013.
  - The Lyon Arboretum's Seed Conservation Laboratory (2014) has 711 seeds from five accessions in genetic storage.
  - The National Tropical Botanical Garden (2014) has more than 240 seeds from four accessions in genetic storage.
  - The Maui Nui Botanical Gardens (2013) has 7 individuals in their garden and 100 seeds in genetic storage (Maui Nui Botanical Gardens 2014).
  - The Waimea Valley (2014) has two individuals in their garden.

- Reintroduction / translocation – In 2012, 93 individuals of *H. hualalaiensis* were reintroduced in a Natural Area Reserve System on Hawaii Island (State of Hawaii Department of Land and Natural Resources 2012).
- Outreach and education
  - *Hibiscadelphus hualalaiensis*, along with other PEPP species, was highlighted at the Big Island County Fair held during September 4 to 7, 2014 in Hilo. Visitors to the booth participated in coloring images of PEPP species to create a button for them to take home (PEPP 2015).
  - *Hibiscadelphus hualalaiensis* was the spotlight species for the 2014 Run for the Dry Forest, which is an annual running, fundraiser, and community outreach event showcasing Hawaii’s dry forest ecosystems (PEPP 2015). Each runner received a t-shirt of *H. hualalaiensis* that was designed by PEPP.

**Synthesis:**

Stabilizing, downlisting, and delisting objectives are provided in the Big Island II addendum to the recovery plan for Big Island 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 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 interim stabilization goals for this species have not been met, as only 97 reintroduced individuals are known and the maturity of those individuals is unknown (Table 1), and all threats are not being sufficiently managed throughout all of the populations (Table 2). Therefore, *Hibiscadelphus hualalaiensis* meets the definition of endangered as it remains in danger of extinction throughout its range.

**Recommendations for Future Actions:**

- Surveys / inventories – Survey geographical and historical range for a current assessment of the species’ status.
- Captive propagation for genetic storage and reintroduction
  - Continue collection of genetic resources for storage, propagation, and reintroduction into protected suitable habitat within historical range.
  - Evaluate genetic resources currently in storage to determine the need to place additional genetic resources in long-term storage due to this species’ vulnerability to climate change.
- Ungulate monitoring and control – Maintain existing exclosures and monitor for potential incursions.
- Invasive plant monitoring and control – Eradicate invasive introduced plants within ungulate exclosures and maintain exclosures free of invasive plants.
- Population viability monitoring and analysis – Continue monitoring outplanted individuals.

- Fire monitoring and control – Develop and implement a fire management plan at the existing exclosures.
- Climate change adaptation strategy – Research the suitability of habitat for reintroducing this species in the future due to the impacts of climate change. Develop a strategy for preventing the extinction of this species if no suitable habitat is predicted in the future.
- 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 *Hibiscadelphus hualalaiensis* from listing through current 5-year review.**

<b>Date</b>	<b>No. wild indivs</b>	<b>No. outplanted</b>	<b>Stability Criteria identified in Recovery Plan</b>	<b>Stability Criteria Completed?</b>
1994 (listing)	0	22	All threats managed in all 3 populations	Partially
			Complete genetic storage	Yes
			3 populations with 25 mature individuals each	No
1998 (recovery plan)	0	30	All threats managed in all 3 populations	Partially
			Complete genetic storage	Yes
			3 populations with 25 mature individuals each	No
2003 (critical habitat)	0	12	All threats managed in all 3 populations	Partially
			Complete genetic storage	Yes
			3 populations with 25 mature individuals each	No
2008 (5-yr review)	0	ca 100	All threats managed in all 3 populations	Partially
			Complete genetic storage	Yes
			3 populations with 25 mature individuals each	Partially
2015 (5-yr review)	0	ca 97	All threats managed in all 3 populations	Partially
			Complete genetic storage	Yes
			3 populations with 25 mature individuals each	Partially

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

<b>Threat</b>	<b>Listing factor</b>	<b>Current Status</b>	<b>Conservation/ Management Efforts</b>
Ungulates – degradation of habitat and herbivory	A, C, D, E	Ongoing	Yes, all reintroductions are in fenced areas
Invasive introduced plants	A, E	Ongoing	None
Lava flows	A	Ongoing	None
Agricultural and urban development	A	Ongoing	None
Invertebrate predation or herbivory – moth	C	Ongoing	None
Rodent predation or herbivory – rats	C	Ongoing	None
Introduced birds - nectar robber	C	Ongoing	None
Fire	E	Ongoing	None
Low numbers	E	Ongoing	Partially, captive propagation for genetic storage and reintroduction
Climate change	A, E	Increasing	None

**References:**

See previous 5-year review for a full list of references (USFWS 2008). 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.

Harold L. Lyon Arboretum Seed Conservation Laboratory. 2014. Report on controlled propagation of listed and candidate species, as designated under the U.S. Endangered Species Act. Seed storage access database. University of Hawaii at Manoa, Honolulu, Hawaii. Unpublished.

Plant Extinction Prevention Program. 2010. Plant Extinction Prevention Program annual report, fiscal year 2010 (July 1, 2009-June 30, 2010). Unpublished report submitted to the U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office, Honolulu, Hawaii.

Plant Extinction Prevention Program. 2015. Plant Extinction Prevention Program progress report, fiscal year 2015, QTR 1-2 (July 1, 2014-December 31, 2014). Unpublished report submitted to the U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office, Honolulu, Hawaii.

Maui Nui Botanical Gardens. 2013. Report on controlled propagation of listed and candidate species, as designated under the U.S. Endangered Species Act. Unpublished.

Maui Nui Botanical Gardens. 2014. Report on controlled propagation of listed and candidate species, as designated under the U.S. Endangered Species Act. Unpublished.

National Tropical Botanical Garden. 2014. Report on controlled propagation of listed and candidate species, as designated under the U.S. Endangered Species Act. Unpublished.

State of Hawaii Department of Land and Natural Resources. 2012. Department of Land and Natural Resources, Division of Forestry and Wildlife, Section 6 annual performance report for plant habitat management, Natural Area Reserves, Hawai'i. July 1 2011 – June 30, 2012. 9 pages. Unpublished.

[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, Oregon. 80 pages + appendices.

[USFWS] U.S. Fish and Wildlife Service. 2008. *Hibiscadelphus hualalaiensis* 5-year review short form summary. Pacific Islands Fish and Wildlife Office, Honolulu, Hawaii. 6 pages.

Volcano Rare Plant Facility. 2013. Report on controlled propagation of listed and candidate species, as designated under the U.S. Endangered Species Act. Unpublished.

Waimea Valley. 2014. Report on controlled propagation of listed and candidate species, as designated under the U.S. Endangered Species Act. Unpublished.

**Personal communication:**

Wagner, Jill. 2015. Owner and Biological Services Consultant, Future Forests Nursery and Hawaii Forest Initiative. E-mail to Chelsie Javar-Salas, Pacific Islands Fish and Wildlife Office, dated February 14, 2015. Subject: Request for info for 5-year reviews.

**U.S. FISH AND WILDLIFE SERVICE**  
**SIGNATURE PAGE for 5-YEAR REVIEW of *Hibiscadelphus hualalaiensis* (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
- No Change in listing status

Appropriate Listing/Reclassification Priority Number, if applicable: \_\_\_\_\_

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

Maire M. Bueagman

Date 2015-08-03