

5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Pritchardia schattaueri* (Lo`ulu)

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):

Christian Torres-Santana, Pacific Islands Fish and Wildlife Office, Student Trainee Biologist
Marie M. 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 proposed rule and final critical habitat designation for *Pritchardia schattaueri* and other species from the island of Hawaii (USFWS 2002, 2003), as well as a review of current, available information. 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 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 proposed and final rule for critical habitat designation for *Pritchardia schattaueri* published in the Federal Register on May 28, 2002, and July 2, 2003, respectively (USFWS 2002, 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 *P. schattaueri*.

Pritchardia schattaueri is endemic to the island of Hawaii. Since Federal listing of this species as endangered (USFWS 1996), the three wild populations with 13 individuals have declined to 12 mature individuals in two populations due to the senescence of one mature individual on private land in South Kona. The Hoomau population consists of 10 mature individuals. The Kapua population, on the edge of a macadamia nut (*Macadamia integrifolia*) farm in degraded mesic forest, consists of two mature individuals (USFWS 2008a; Plant Extinction Prevention Program 2007). Outplanting efforts in the Honomalino Forest Reserve and the Kipahoe Natural Area Reserve have resulted in two new populations consisting of a total of 78 seedlings. Two other outplantings of unknown numbers have occurred in Honomalino and Manuka (Plant Extinction Prevention Program 2007). All populations have largely been protected from ungulate activities through small-scale fencing. However, regeneration *in situ* (on-site) has not been observed (Chapin *et al.* 2004).

The three wild populations are found in degraded or highly altered mesic forest habitats. The Honomalino Forest Reserve and Kipahoe reintroduced populations are in relatively healthy native mesic *Metrosideros polymorpha* (ohia) forest (Plant Extinction Prevention Program 2007).

Threats to the species include grazing and trampling by feral ungulates (Factor A, C, and D); competition from introduced invasive plant species (Factor E); seed predation by rats (*Rattus* spp.) (Factor C); residential and commercial development (Factor A); overcollection (Factor B); habitat modification due to volcanic activity (Factor E); risk of extinction from naturally occurring events (Factor E); and/or reduced reproductive vigor due to the small number of existing populations and individuals and the lack of successful regeneration (Factor E) (USFWS 1996; 1998, 2002; Chapin *et al.* 2004; Plant Extinction Prevention Program 2007).

Introduced invasive plant species, particularly *Schinus terebinthifolius* (Christmasberry) and pasture weeds at the Hoomau population, compete with mature trees and seedlings of *Pritchardia schattaueri*. Other invasive plant species threatening the habitat of *P. schattaueri* are *Psidium cattleianum* (strawberry guava), *Psidium guava* (common guava), *Pennisetum clandestinum* (kikuyu grass), and *Rubus rosifolius* (thimbleberry). Digging by feral pigs (*Sus scrofa*) destroys seedlings and habitat, particularly at Kapua and Manuka; and cattle (*Bos taurus*) damage the habitat. However, most of the populations are currently protected by ungulate fencing (Plant Extinction Prevention Program 2007). Seed collectors and vandalism pose an issue for the wild individuals, as palms are highly prized by certain amateur collectors (USFWS 1996, 1998, 2002; Plant Extinction Prevention Program 2007). Residential and commercial development continue to threaten this species; all wild populations are located on private lands (Factor A).

Rats feed on seeds and seedlings and can damage palm hearts (Factor C), particularly at Hoomau and Kapua (Chapin *et al.* 2004). Another threat is potential invertebrate predation, although the invertebrate species are unknown (Factor C). *Pritchardia* species are known to be particularly susceptible to lethal yellowing disease; this is a potential threat should the disease and its vector (*Myndus crudus*) arrive in Hawaii (Factor C). Two other threats are West Indian sugarcane borers (*Metamasius hemipterus*) known to damage palms in Florida, and the two-spotted leaf

hopper (*Sophonia rufofascia*), which is present in Hawaii and affects a suite of native species including *Pritchardia* species (Factor C) (Chapin *et al.* 2004).

In addition to other threats, species such as *Pritcharda schattaueri* 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, landslides, fire, volcanic activity, droughts, flooding and disease outbreaks (Factor E) (USFWS 1998). When considered on their own, the natural processes associated with being a single island endemic do not affect *P. schattaueri* 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 human development and habitat loss from or predation by introduced species (Factor E) (USFWS 1998).

To safeguard existing genetic material, propagation for genetic storage and reintroduction is occurring at the Honolulu Botanical Gardens, Waimea Arboretum, Amy B.H. Greenwell Ethnobotanical Garden, and the Volcano Rare Plant Facility (USFWS 2008b). In 2008, Honolulu Botanical Gardens (2008) had 36 plants representing eight wild *Pritchardia schattaueri* individuals in genetic storage. Waimea Arboretum (2008) has four individuals in controlled propagation and another five seeds in long-term storage, representing two wild individuals. Seeds from extant wild trees have also been propagated by the Amy B.H. Greenwell Ethnobotanical Gardens (Plant Extinction Prevention Program 2007). Due to rat control activities at the Kapua site, seeds have been collected and placed in storage and in cultivation (Plant Extinction Prevention Program 2007). Outplanting efforts in the Honomalino Forest Reserve and the Kipahohoe Natural Area Reserve have created two new populations consisting of a total of 78 seedlings. Two other outplantings of unknown numbers have occurred in Honomalino and Manuka (Volcano Rare Plant Facility 2006, 2007, 2008; Plant Extinction Prevention Program 2007).

Stabilizing, downlisting, and delisting objectives are provided in the addendum to the recovery plan 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. *Pritchardia schattaueri* 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 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 as only 12 mature wild individuals and 109 reintroduced seedlings remain, and not all threats have been managed (see Table 1). Therefore, *Pritchardia schattaueri* meets the definition of endangered as it remains in danger of extinction throughout its range.

Recommendations for Future Actions:

- Continue collection of genetic resources for storage, future propagation, and reintroduction into protected suitable habitat within historical range.
- Control introduced invasive plant species around wild and reintroduced plants.
- Construct large-scale fences around all naturally occurring and reintroduced individuals to exclude feral ungulates for ecosystem level management.
- Control rats around all wild and reintroduced individuals.
- Collect fruit from any reintroduced individuals that set seed to add to the genetic diversity of the *ex situ* material.
- Assess the genetic variability within wild and reintroduced populations.
- Establish effective quarantine to prevent the introduction of new diseases and those already known to affect *Pritchardia* that are not yet present in the Hawaiian Islands.
- Study *Pritchardia schattaueri* 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:

- Chapin, M.H., Wood, K.R., Perlman, S.P., and Maunder, M. 2004. A review of conservation status of the endemic *Pritchardia* palms of Hawaii. *Oryx* 38(3):273-281.
- Honolulu Botanical Gardens. 2008. Report on controlled propagation of listed and candidate species, as designated under the U.S. Endangered Species Act. Unpublished.
- Plant Extinction Prevention Program. 2007. Big Island Plant Extinction Prevention Program Excel spreadsheet. Unpublished.
- [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; final rule. *Federal Register* 61(198):53137-53153
- [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. 88 pp. + appendices.
- [USFWS] U.S. Fish and Wildlife Service. 2002. Endangered and threatened wildlife and plants; designation of critical habitat for plant species from the island of Hawaii, HI; proposed rule. *Federal Register* 67(102):36968-37106.

- [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):39624-39761.
- [USFWS] U.S. Fish and Wildlife Service. 2008a. Rare plant tracking database. Pacific Islands Fish and Wildlife Office, Honolulu, HI. Accessed on April 28, 2008. Unpublished.
- [USFWS] U.S. Fish and Wildlife Service. 2008b. Controlled propagation database. Pacific Islands Fish and Wildlife Office, Honolulu, HI. Accessed on November 20, 2008. Unpublished.
- Volcano Rare Plant Facility. 2006. Report on controlled propagation of listed and candidate species, as designated under the U.S. Endangered Species Act. Unpublished.
- Volcano Rare Plant Facility. 2007. Report on controlled propagation of listed and candidate species, as designated under the U.S. Endangered Species Act. Unpublished.
- Volcano Rare Plant Facility. 2008. Report on controlled propagation of listed and candidate species, as designated under the U.S. Endangered Species Act. Unpublished.
- Waimea Arboretum. 2008. Report on controlled propagation of listed and candidate species, as designated under the U.S. Endangered Species Act. Unpublished.

Table 1. Status of *Pritchardia schattaueri* from listing through 5-year review.

Date	No. wild individuals	No. outplanted	Stability Criteria identified in Recovery Plan	Stability Criteria Completed?
1996 – listing	12	10	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially
			3 populations with 25 mature individuals each	No
1998 – recovery plan	12	56	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially
			3 populations with 25 mature individuals each	No
2003 – critical habitat	12	Unknown	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially
			3 populations with 25 mature individuals each	No
2008 – 5-yr review	12	109	All threats managed	Partially
			Complete genetic storage	Partially
			3 populations with 25 mature individuals each	No

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SIGNATURE PAGE for 5-YEAR REVIEW of *Pritchardia schattaueri* (Lo'ulu)

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

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Date 6/2/09