

5-YEAR REVIEW

Short Form Summary*

Species Reviewed: *Phyllostegia waimeae* (No common name)

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:

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Methodology used to complete this 5-year review:

This review was based on the final critical habitat designation for *Phyllostegia waimeae* and other species from the island of Kauai. The National Tropical Botanical Garden provided the updated information on the current status of *Phyllostegia waimeae*.

Application of the 1996 Distinct Population Segment (DPS) Policy:

Not applicable.

Review Analysis:

Please refer to the final critical habitat designation for *Phyllostegia waimeae* published in the Federal Register on February 27, 2003 (68 FR 9116) for a complete five-factor analysis and a discussion of the species' status (including biology and habitat), threats, and management efforts. No significant new information regarding the species' biological status has come to light since this listing to warrant a change in the Federal listing status of *P. waimeae*.

Phyllostegia waimeae is currently known to occur in two locations on Kauai. Two individuals were found at Kawaiiki in 2000, on State Forest Reserve land. Eight mature individuals and 20 seedlings were observed during subsequent surveys in June 2001 (Perlman 2006). Feral pig sign was observed in the area and a number of plants had been

This short form is to be used ONLY when there is no new information, or when the 5-year review is being done concurrent with another range-wide status review (such as a 12-month finding on a delisting petition) that completely addresses all the questions outlined in the standard 5-year review template. Attach a copy of the final 12-month finding or other status review to this form.

uprooted (Wood 2006). Four plants were seen in 2002, but botanists were not able to relocate them during subsequent site visits in 2005 or 2006. However, it is likely that some plants are still in the area, as suitable habitat remains (S. Perlman, National Tropical Botanical Garden, pers. comm. 2006). The second location is in the Koaie drainage above Twin Falls, where two individuals were observed in September 2001. The historical location in Waimea Canyon, where *P. waimeae* was last seen in 1969, has been searched several times, but no plants have been found. The area is now very weedy and has many goats. Additionally, the last two hurricanes opened many gaps in the canopy, which were filled by *Lantana camara* (lantana), a particularly invasive plant species (Perlman 2006). *Phyllostegia waimeae* seems to grow best at higher elevations and associated cooler temperatures (R. Nishek, pers. comm. 2006).

Major threats to *P. waimeae* include feral pigs (*Sus scrofa*) and goats (*Capra hircus*) uprooting plants and causing habitat degradation and erosion (Factors A, D, and E); rats (*Rattus* spp.) eating leaves and seeds (Factor C); over-collecting for scientific purposes (Factor B); habitat degradation by invasive introduced plant species such as *Grevillea robusta* (silk oak), *Morella faya* (firetree), *Rubus argutus* (prickly Florida blackberry), *Psidium cattleianum* (strawberry guava), and *Lantana camara* (lantana) that compete with and degrade habitat of *P. waimeae* (Factor E); and the risk of extinction from stochastic events and reduced reproductive vigor due to the small number of individuals (Factor E) (68 FR 9116; Perlman 2006; Wood 2006). In the nursery, *P. waimeae* is attacked by spider mites, mealy bugs, *Phytophthora* fungus and mildew (Factor C) (R. Nishek, National Tropical Botanical Garden, pers. comm. 2006).

The Hawaii Division of Forestry and Wildlife has outplanted 60 individuals at their enclosure at Kalalau Rim for *ex situ* genetic storage (Hawaii Division of Forestry and Wildlife, Kauai 2006). The National Tropical Botanical Garden currently has 59 plants in the nursery, grown from cuttings. The Hawaii Division of Forestry and Wildlife, Kauai, has seeds in storage and 20 plants in controlled propagation (National Tropical Botanical Garden 2006; Hawaii Division of Forestry and Wildlife, Kauai 2006). It is a relatively short-lived plant, which may need to be replaced once outplanted, if it does not reproduce within its short lifespan. Although grown relatively easily from cuttings, in the nursery *P. waimeae* is attacked by spider mites, mealy bugs, *Phytophthora* and mildew (R. Nishek, pers. comm. 2006).

Stabilizing, downlisting, and delisting objectives are provided in the recovery plan for Kauai plants (USFWS 1995), based on whether the species is an annual, a short-lived perennial (fewer than 10 years), or a long-lived perennial. *Phyllostegia waimeae* is a short-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* (off-site) collection. In addition, a minimum of three populations should be documented on Oahu. Each of these populations must be naturally reproducing and increasing in number, with a minimum of 50 mature individuals per population.

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

Recommendations for Future Actions:

- Increase the number of individuals in cultivation and genetic storage through controlled propagation.
- Survey for populations in suitable habitat within historical sites.
- Augment populations as plants become available in nurseries and habitat is protected.
- Reintroduce populations in areas of suitable habitat that can be protected from goats and other ungulates, rats, and human disturbance.
- Fence remaining populations and control ungulates to maintain the remaining populations.
- Control introduced invasive plant species around the remaining populations.
- Study new or reintroduced *Phyllostegia waimeae* 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. 2006. Report on controlled propagation of species, as designated under the U.S. Endangered Species Act. Unpublished.
- Hawaii Division of Forestry and Wildlife, Kauai. 2006. Report on controlled propagation of species, as designated under the U.S. Endangered Species Act. Unpublished.
- National Tropical Botanical Garden. 2006. Report on controlled propagation of species, as designated under the U.S. Endangered Species Act. Unpublished.
- Perlman, S. 2006. National Tropical Botanical Garden, summary of field notes for *Phyllostegia waimeae* from August 23, 2000 to September 25, 2001. Unpublished.
- [68 FR 9116] 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. 1995. Recovery Plan for the Kaua'i plant cluster. U.S. Fish and Wildlife Service, Portland Oregon. 227 pages.

[USFWS] U.S. Fish and Wildlife Service. 1994. Final listing 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.

Wood, K.R. 2006. National Tropical Botanical Garden, field notes for August 23-5, 2000, February 27, 2001, June 27, 2001. Unpublished.

Personal Communication:

Nishek, Robert. 2006. Nursery Manager, National Tropical Botanical Garden, September 5, 2006.

Perlman, S. 2006. Field Botanist, National Tropical Botanical Garden, November 2, 2006.

Table 1. Status of *Phyllostegia waimeae* from listing through 5-year review.

Date	No. wild inds	No. outplanted	Stability Criteria	Stability Criteria Completed?
1994 – listing	1	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 25 mature individuals each	No
1995 – recovery plan	0	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 25 mature individuals each	No
2003 – critical habitat	6	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 25 mature individuals each	No

2007 – 5-yr review	6	0	All threats managed	No
			Complete genetic storage	Yes
			3 pops with 25 mature individuals each	No

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SIGNATURE PAGE for 5-YEAR REVIEW on *Phyllostegia waimeae* (No common name)

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

Lead Field Supervisor, Fish and Wildlife Service

Approve *Patrick [Signature]*

Date 1/18/08