

## **5-YEAR REVIEW**

### Short Form Summary

**Species Reviewed:** *Lipochaeta waimeaensis* (nehe)

**Current Classification:** Endangered

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

[USFWS] U.S. Fish and Wildlife Service. 2008. Endangered and threatened wildlife and plants; initiation of 5-year status reviews of 70 species in Idaho, Montana, Oregon, Washington, and the Pacific Islands. Federal Register 73(83):23264-23266.

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

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

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

Marie Bruegmann, Pacific Islands Fish and Wildlife Office, Plant Recovery Coordinator  
Marilet A. Zablan, Pacific Islands Fish and Wildlife Office, Assistant Field Supervisor for Endangered Species  
Jeff Newman, Pacific Islands Fish and Wildlife Office, Acting Deputy Field Supervisor

#### **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 29, 2008. The review was based on the final critical habitat designation for *Lipochaeta waimeaensis* and other species from the island of Kauai (USFWS 2003), as well as a review of current, available information. The National Tropical Botanical Garden 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 Tamara Sherrill, biological consultant, was reviewed by the Plant Recovery Coordinator. The document was then reviewed by the Assistant Field Supervisor for Endangered Species and Acting Deputy Field Supervisor 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](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 final critical habitat designation for *Lipochaeta waimeaensis* published in the Federal Register on February 27, 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 *L. waimeaensis*.

At the time of listing in 1994, fewer than ten plants were known from a 1-hectare (2.5 acre) area (USFWS 1994). Currently, approximately 180 individuals of all ages are found on eroded soil in a precipitous, shrub-covered gulch in degraded lowland forest on the edge of Waimea Canyon on the island of Kauai. Elevations have been reported between 44 and 457 meters (145 and 1,500 feet) (USFWS 2003), but most recently it has been observed between 335 to 365 meters (1,100 to 1,200 feet) elevation (Tangalin 2005; Perlman 2008).

*Lipochaeta waimeaensis* is still represented by just one population in Waimea Canyon at 335 to 484 meters (1,100 to 1,260 feet) elevation. In April 2001, 50 mature individuals, 30 immature individuals, and 50 seedlings were seen. Subsequently in May of that year, 100 mature individuals, 50 immature individuals, and 30 seedlings were seen. They were also visited in March 2005 (Tangalin 2005; Perlman 2008) but the number of individuals were not recorded.

The species *Lipochaeta waimeaensis* was reassigned to the genus *Melanthera* in a revision published in 2001 (Wagner and Robinson 2001). Therefore, this species will be referred to as *Melanthera waimeaensis* for the remainder of this review.

The habitat where *Melanthera waimeaensis* occurs is degraded *Dodonaea viscosa* (aalii) dry shrubland with mostly invasive introduced plant vegetation and some native plant species including *Artemisia australis* (ahinahina), *Bidens sandwicensis* (kookoolau), *Chamaesyce celastroides* (akoko), *Doryopteris decipiens* (kumuniu), *Eragrostis variabilis* (kawelu), *Heteropogon contortus* (pili), *Lipochaeta connata* var. *connata* (nehe), *Panicum* spp. (no common name [NCN]), *Santalum freycinetianum* (iliahi), *Schiedea spergulina* var. *spergulina* (NCN), *Sida fallax* (ilima), and *Spermolepis hawaiiensis* (NCN) (USFWS 2003).

Large numbers of feral goats (*Capra hircus*) in Waimea Canyon exacerbate the existing soil erosion problem (Factor A). Invasive introduced plant species which compete for scarce resources and modify the habitat include *Chloris barbata* (swollen fingergrass), *Emilia* sp. (Flora's paintbrush), *Grevillea robusta* (silk oak), *Hyptis* sp. (NCN), *Melinis repens* (rose Natal grass), *Opuntia ficus-indica* (panini), *Lantana camara* (lantana), *Leucaena leucocephala* (haole koa), and especially *Panicum maximum* (Guinea grass) (Factor E) (Perlman 2008).

Predation has been observed by mice (*Mus* sp.), rats (*Rattus* spp.), and various insects, including spittle bugs (*Clasoptera xanthocephala*), on leaves (Factor C) (Perlman 2008).

Reduced reproductive vigor due to the small number of existing individuals is likely (USFWS 1994). Overcollecting for scientific purposes (Factor B) was considered a threat in 1991 (USFWS 1994) but this threat has not been documented since that time.

Climate change may also pose a threat to *Melanthera waimeaensis* (Factors A and E). However, current climate change models do not allow us to predict specifically what those effects, and their extent, would be for this species.

In addition to all of the other threats, species like *Melanthera waimeaensis* 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, flooding, and disease outbreaks (Factor E). The effects of these processes on this single-island endemic are exacerbated by anthropogenic threats, such as habitat loss for human development or predation by introduced species (Factor E) (USFWS 2003).

Botanists have been visiting the population of wild *Melanthera waimeaensis* collected seeds from a total of 25 different individuals, which were sent to the Hawaii Division of Forestry and Wildlife and National Tropical Botanical Garden for propagation, and to National Tropical Botanical Garden and the University of Hawaii's Seed Storage Laboratory for genetic storage (Tangalin 2005; Perlman 2008). Cuttings have been taken to the National Tropical Botanical Garden nursery for propagation, and one botanist was able to collect seeds from nursery plants (Tangalin 2004).

Stabilizing, downlisting, and delisting objectives are provided in the recovery plan for the Kauai plant cluster (USFWS 1995), based on whether the species is an annual, a short-lived perennial (fewer than 10 years), or a long-lived perennial. *Melanthera waimeaensis* 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* (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. Each of these populations must be naturally reproducing and increasing in number, with a minimum of 50 mature individuals per population.

The interim stabilization goals for this species have not been met (see Table 1), as only one population has more than 50 mature individuals and all threats are not being managed. Therefore, *Melanthera waimeaensis* meets the definition of endangered as it remains in danger of extinction throughout its range.

#### **Recommendations for Future Actions:**

- Collect material for genetic storage and propagation for reintroduction.
- Determine methods to control goats in the steep terrain.
- Control introduced invasive plant species around wild plants.
- Assess other sites with potential suitable habitat to protect and establish reintroductions.

- Work with Hawaii Division of Forestry and Wildlife and Hawaii State Parks to initiate planning and contribute to implementation of ecosystem-level restoration and management to benefit this species.
- Investigate techniques to improve natural recruitment.
- Update the listed entity on 50 CFR 17 to match the currently recognized taxonomy.

### References:

- Perlman, S. 2008. *Melanthera waimeaensis*. National Tropical Botanical Garden, Kalaheo, Hawaii. 2 pages. Unpublished.
- Tangalin, N. 2004. National Tropical Botanical Garden database accession data 040405, *Melanthera waimeaensis*. National Tropical Botanical Garden, Kalaheo, Hawaii. 1 page. Unpublished.
- Tangalin, N. 2005. National Tropical Botanical Garden database accession data 050096, *Melanthera waimeaensis*. National Tropical Botanical Garden, Kalaheo, Hawaii. 2 pages. Unpublished.
- [USFWS] U.S. Fish and Wildlife Service. 1994. Endangered and threatened wildlife and plants; determination of endangered or threatened status for 24 plants from the island of Kauai, Hawaii; final rule. Federal Register 59(38):9304-9329.
- [USFWS] U.S. Fish and Wildlife Service. 1995. Recovery plan for the Kauai plant cluster. U.S. Fish and Wildlife Service, Portland, Oregon. 270 pages.
- [USFWS] 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, Hawaii; final rule. Federal Register 68(39):9116-9479.
- Wagner, W.L., and H. Robinson. 2001. *Lipochaeta* and *Melanthera* (Asteraceae : Heliantheae subtribe Ecliptinae): establishing their natural limits and a synopsis. Brittonia 53(4):539-561.

**Table 1. Status of *Melanthera waimeaensis* from listing through 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)	Less than 10	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
1995 (recovery plan)	100	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2003 (critical habitat)	100	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2009 (5-year review)	100	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No

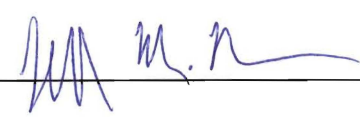
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SIGNATURE PAGE for 5-YEAR REVIEW of *Lipochaeta waimeaensis* (nehe)

**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

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

  
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Date   AUG 27 2010