

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. 2020. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status reviews for 129 Species in Oregon, Washington, Idaho, Hawaii, Montana, California, and Nevada. Federal Register 85(48): 14240–14243, March 11, 2020.

Lead Region/Field Office:

Interior Region 12/Pacific Islands Fish and Wildlife Office (PIFWO), Honolulu, Hawai‘i

Name of Reviewer:

Cheryl Phillipson, Biologist, PIFWO

Lauren Weisenberger, Plant Recovery Coordinator, PIFWO

Megan Laut, Conservation & Restoration Team Manager, PIFWO

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 (Service or USFWS) beginning in October 2021. The review was based on a review of current, available information since the last 5-year review for *Lipochaeta waimeaensis* (USFWS 2017). The evaluation by Cheryl Phillipson, Biologist, was reviewed by Lauren Weisenberger, Plant Recovery Coordinator, and Megan Laut, Conservation and Restoration Team Manager.

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 (<https://ecos.fws.gov/ecp/species/4713>).

Review Analysis:

Please refer to the previous 5-year reviews for *Lipochaeta waimeaensis* published in the Federal Register on August 28, 2012, and September 16, 2017 (available at https://ecos.fws.gov/docs/tess/species_nonpublish/1623.pdf and https://ecos.fws.gov/docs/tess/species_nonpublish/2471.pdf) for a complete review of the species’ status, threats, management efforts, and references cited. We are not aware of any significant new information regarding the species’ biological status since listing to warrant a change in the Federal listing status of *L. waimeaensis*.

This short-lived perennial herb in the Asteraceae (sunflower) family is listed as endangered and is known from the island of Kaua‘i. The status and trends for the two subspecies of *Lipochaeta waimeaensis* are provided in the tables below.

New Status Information:

- In 2018, seven individuals of *Lipochaeta waimeaensis* were observed along the Waimea Canyon rim on Kaua'i (NTBG 2018).
- In 2017, the Service acknowledged the change of taxonomy from *Lipochaeta waimeaensis* to *Melanthera waimeaensis* for this species (Wagner and Robinson 2001, Wagner et al. 2012). A study by Orchard (2013, pp. 338, 388) transferred *Lipochaeta waimeaensis* to *Wollastonia waimeaensis* based on geographical range and morphological characteristics. However, later research suggested that this species should retain the genus *Lipochaeta* (Edwards et al. 2018). The change from *Lipochaeta* to *Wollastonia* was recently accepted on the Smithsonian's Hawaiian Flora Checklist (2022, <https://naturalhistory2.si.edu/botany/hawaiianflora/>) pending publication of a new supplement to the Manual of the Flowering Plants of Hawai'i (Wagner 2021, in litt.). The Service will await publication before recommending a technical revision to 50 CFR 17.12.

New Threats:

- None reported.

New Management Actions:

- Surveys and inventories—In 2019, the population at Waimea Canyon rim was monitored (Perlman and Wood 2019).
- Collection and propagation—
 - In 2019, the National Tropical Botanical Garden (NTBG) reported collection and storage of 14 seeds representing one individual in a living collection sourced from a founder at Waimea Canyon rim. Four clones of another plant in a living collection were added to the collection at the Southshore garden (NTBG 2019). In 2020, eight clones of two plants in living collections at the NTBG and McBryde gardens were propagated in the nursery (NTBG 2020, 2021).
 - In 2001, and 2008 through 2013, the Lyon Arboretum Seed Conservation Laboratory reported that 3,307 seeds were stored representing 143 founders from one population at lower Waimea (Lyon Arboretum 2022).
- Reintroduction and augmentation—In 2016, 59 immature plants were added to a reintroduced population at upper Waimea. In 2017, an additional 17 individuals were reintroduced, to total 77 mature and 17 immature plants (Perlman 2016, 2017).

Table 1. Status and trends of *Lipochaeta waimeaensis* from listing through current 5-year review.

Date	No. wild individuals	No. outplanted	Stability Criteria as identified by HPPRCC	Stability Criteria Completed?
1994 (listing)	<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)	ca 100	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2010 (5-year review)	100 mature 50 immature	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partially, cuttings and seed collections
			3 populations with 50 mature individuals each	No
Date	No. wild individuals	No. outplanted	*Preventing Extinction Criteria identified by HPPRCC	*Preventing Extinction Criteria Completed?
2017 (5-year review)	40 mature	300, 90 remain	All threats managed in all 3 populations	Partially, reintroductions in enclosure

			Complete genetic storage	Complete? cuttings and seed collections
			Reproduction (i.e., viable seeds, seedlings) at all 3 populations	No
			3 populations with 100 mature individuals each	No
2022 (5-year review)	7	76 added; total remaining 77 mature 17 immature	All threats managed in all 3 populations	Partially, 1 reintroduced population fenced
			Complete genetic storage	Complete, 143 founders from the only known population represented
			Natural reproduction at all 3 populations	No
			3 populations with 50 mature individuals each	Partially, 1 reintroduced population

* The Preventing Extinction Stage was established in 2011. Prior to 2011, the Interim Stabilization Stage was the first stage towards recovery (now it is the second stage after Preventing Extinction).

Table 2. Threats to *Lipochaeta waimeaensis* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Degradation and destruction of habitat and herbivory by feral ungulates	A, C	Ongoing	Partial, reintroductions in enclosure
Established ecosystem altering invasive plant species degradation of habitat and competition	A, E	Ongoing	Partial, reintroductions in enclosure
Destruction and degradation by landslides	A	Ongoing	None
Destruction and degradation by fire	A	Ongoing	None
Climate change degradation and destruction of habitat, including hurricanes	A	Ongoing	None
Predation and herbivory by rodents	C	Ongoing	None

Predation and herbivory by invertebrates	C	Ongoing	Partial, investigation of invertebrate predation
Reduced viability due to low numbers	E	Ongoing	Partial, seed collection and propagation

Synthesis:

Currently, there are seven wild individuals of *Lipochaeta waimeaensis* on Kaua‘i. More than 3,300 seeds are in storage and 17 plants representing founders from Koai‘e are in storage in two plant nurseries; 12 plants were added to living collections. Two areas have small enclosures to protect individuals from feral ungulates.

Stabilizing (interim), downlisting, and delisting objectives are provided in the Kaua‘i Islandwide Recovery Plan (USFWS 2021) and have been updated according to the draft revised recovery objective guidelines developed by the Hawai‘i and Pacific Plants Recovery Coordinating Committee (HPPRCC 2011). The HPPRCC identifies an additional initial objective, the Preventing Extinction Stage, in addition to the Interim Stabilization, Delisting, and Downlisting objectives. Furthermore, life history traits such as breeding system, population size fluctuation or decline, and reproduction type (sexual or vegetative), have been included in the calculation of goals for the number of populations and reproducing individuals for each stage. The goals for each stage remain grouped by life span defined as annual, short-lived perennial (fewer than 10 years), or long-lived perennial.

Lipochaeta waimeaensis is a short-lived perennial herb. To prevent extinction, which is the first milestone in recovering the species, the taxon must be managed to control threats (e.g., fenced) and have 50 individuals (or the total number of individuals if fewer than 50 exist) from each of three populations represented in *ex situ* (secured off-site, such as a nursery or seed bank) collections that are well managed. In addition, a minimum of a total of three populations should be documented on Kaua‘i where this species now occurs or occurred historically and each of these populations must be naturally reproducing (i.e., viable seeds, seedlings) with a minimum of 50 mature, reproducing individuals per population.

The preventing extinction goals for *Lipochaeta waimeaensis* have not been met. The population is rapidly declining and there are only seven wild individuals remaining in widely separated areas (Table 1). Seed collections (representing 143 founders) and propagation are ongoing with plants also in a living collection (Table 1, Table 2). One reintroduced population is fenced and managed. However, other threats, including landslides, rodent predation, and the effects of hurricanes, are not managed. Therefore, *L. waimeaensis* meets the definition of Endangered as it remains in danger of extinction throughout its range.

Recommendations for Future Actions:

No new threats and no significant new information regarding the species’ biological status have been reported since the last 5-year review in 2017. Thus, the following

recommendations for future actions are reiterated or updated for the 5-year review for 2022.

- Surveys and inventories—Continue to survey for populations of *Lipochaeta waimeaensis* in areas of potentially suitable habitat and monitor known populations to determine their current status.
- Ungulate monitoring and control—Continue to construct and maintain exclosures to protect all occurrences from habitat disturbance and herbivory by feral ungulates.
- Nonnative invasive plant monitoring and control—Continue to control established ecosystem-altering nonnative invasive plant species and those that compete with *L. waimeaensis* at all populations.
- Climate change adaptation strategy—Research suitability of habitat for viability of species, including where to conduct translocations in the future due to impacts of climate change.
- Control of predation and herbivory—
 - Implement effective control methods for rodents at all populations.
 - Continue to research effects of invertebrate predation and determine the need for additional recovery actions.
- Captive propagation for genetic storage and reintroduction—Continue collection of seeds and propagative materials for storage, propagation, and for maintenance of genetic stock.
- Reintroduction and augmentation—Reintroduce individuals into protected suitable habitat within historic range that is being managed for known threats to this species.
- Build resiliency and redundancy—Increase numbers of individuals and populations through historic range to reduce impacts of hurricanes and landslides.
- Alliance and partnership development—Continue to work with partners and other land managers in planning and implementation of ecosystem-level restoration and management to benefit this species.

References:

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U.S. FISH AND WILDLIFE SERVICE
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

_____ Date _____