

Lipochaeta lobata var. *leptophylla*
(nehe)

**5-Year Review
Summary and Evaluation**

**U.S. Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
Honolulu, Hawaii**

5-YEAR REVIEW

Species reviewed: *Lipochaeta lobata* var. *leptophylla* / nehe

TABLE OF CONTENTS

1.0	GENERAL INFORMATION.....	1
1.1	Reviewers.....	1
1.2	Methodology used to complete the review:.....	1
1.3	Background:.....	1
2.0	REVIEW ANALYSIS.....	3
2.1	Application of the 1996 Distinct Population Segment (DPS) policy.....	3
2.2	Recovery Criteria.....	3
2.3	Updated Information and Current Species Status	5
2.4	Synthesis.....	9
3.0	RESULTS	11
3.1	Recommended Classification:.....	11
3.2	New Recovery Priority Number:.....	11
3.3	Listing and Reclassification Priority Number:	11
4.0	RECOMMENDATIONS FOR FUTURE ACTIONS.....	12
5.0	REFERENCES.....	12
	Signature Page.....	14

5-YEAR REVIEW
***Lipochaeta lobata* var. *leptophylla* (nehe)**

1.0 GENERAL INFORMATION

1.1 Reviewers

Lead Regional Office:

Region 1, Endangered Species Program, Division of Recovery, Jesse D`Elia, (503) 231-2071

Lead Field Office:

Pacific Islands Fish and Wildlife Office, Loyal Mehrhoff, Field Supervisor, (808) 792-9400

Cooperating Field Office(s):

N/A

Cooperating Regional Office(s):

N/A

1.2 Methodology used to complete the 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 16, 2009. The review was based on final critical habitat designations for *Lipochaeta lobata* var. *leptophylla* and other species from the island of Oahu (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 Recovery Program Lead and the Assistant Field Supervisor for Endangered Species before submission to the Deputy Field Supervisor for approval.

1.3 Background:

1.3.1 Federal Register (FR) Notice citation announcing initiation of this review:

[USFWS] U.S. Fish and Wildlife Service. 2009. Endangered and threatened wildlife and plants; initiation of 5-year reviews of 103 species in Hawaii. Federal Register 74(49):11130-11133.

1.3.2 Listing history

Original Listing

FR notice: USFWS. 1991. Endangered and threatened wildlife and plants; determination of endangered status for 26 plants from the Waianae Mountains, island of Oahu, Hawaii; final rule. Federal Register 56(209):55770-55786.

Date listed: October 29, 1991

Entity listed: Species

Classification: Endangered

Revised Listing, if applicable

FR notice: N/A

Date listed: N/A

Entity listed: N/A

Classification: N/A

1.3.3 Associated rulemakings:

USFWS. 2003. Endangered and threatened wildlife and plants; final designations or nondesignations of critical habitat for 101 plant species from the island of Oahu, Hawaii; final rule. Federal Register 68(116):35949-36406.

Critical habitat was designated for *Lipochaeta lobata* var. *leptophylla* in two units totaling 673 hectares (1,666 acres) on Oahu. These designations include habitat on State, Federal, and private lands (USFWS 2003).

1.3.4 Review History:

Species status review [FY 2010 Recovery Data Call (September 2010)]:
Improving

Recovery achieved:

1 (0-25%) (FY 2007 Recovery Data Call – most recent year reported)

1.3.5 Species' Recovery Priority Number at start of this 5-year review:

6

1.3.6 Current Recovery Plan or Outline

Name of plan or outline: U.S. Fish and Wildlife Service. 1998. Recovery plan for Oahu plants. U.S. Fish and Wildlife Service, Portland, Oregon. 207 pages plus appendices.

Date issued: August 10, 1998.

Dates of previous revisions, if applicable: N/A

2.0 REVIEW ANALYSIS

2.1 Application of the 1996 Distinct Population Segment (DPS) policy

2.1.1 Is the species under review a vertebrate?

Yes

No

2.1.2 Is the species under review listed as a DPS?

Yes

No

2.1.3 Was the DPS listed prior to 1996?

Yes

No

2.1.3.1 Prior to this 5-year review, was the DPS classification reviewed to ensure it meets the 1996 policy standards?

Yes

No

2.1.3.2 Does the DPS listing meet the discreteness and significance elements of the 1996 DPS policy?

Yes

No

2.1.4 Is there relevant new information for this species regarding the application of the DPS policy?

Yes

No

2.2 Recovery Criteria

2.2.1 Does the species have a final, approved recovery plan containing objective, measurable criteria?

Yes

No

2.2.2 Adequacy of recovery criteria.

2.2.2.1 Do the recovery criteria reflect the best available and most up-to date information on the biology of the species and

its habitat?

Yes
 No

2.2.2.2 Are all of the 5 listing factors that are relevant to the species addressed in the recovery criteria?

Yes
 No

2.2.3 List the recovery criteria as they appear in the recovery plan, and discuss how each criterion has or has not been met, citing information:

A synthesis of the threats (Listing Factors A, C, D, and E) affecting this species is presented in section 2.3.2 and Table 2. Listing Factor B (overutilization for commercial, recreational, scientific, or educational purposes) is not known to be a threat to this species.

Stabilizing, downlisting, and delisting objectives are provided in the recovery plan for Oahu plants (USFWS 1998), based on whether the species is an annual, a short-lived perennial (fewer than 10 years), or a long-lived perennial. *Lipochaeta lobata* var. *leptophylla* is a short-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, weeding, etc.) 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.

This recovery objective has not been met.

For downlisting, a total of five to seven populations of *Lipochaeta lobata* var. *leptophylla* should be documented on Oahu. Each of these populations must be naturally reproducing, stable or increasing in number, and secure from threats, with a minimum of 300 mature individuals per population. Each population should persist at this level for a minimum of five consecutive years before downlisting is considered.

This recovery objective has not been met.

For delisting, a total of eight to ten populations of *Lipochaeta lobata* var. *leptophylla* should be documented on islands where they now occur or occurred historically. Each of these populations must be naturally

reproducing, stable or increasing in number, and secure from threats, with 300 mature individuals per population for short-lived perennials. Each population should persist at this level for a minimum of five consecutive years before delisting is considered.

This recovery objective has not been met.

2.3 Updated Information and Current Species Status

No new information.

2.3.1 Biology and Habitat

2.3.1.1 New information on the species' biology and life history:

No new information.

2.3.1.2 Abundance, population trends (e.g. increasing, decreasing, stable), demographic features (e.g., age structure, sex ratio, family size, birth rate, age at mortality, mortality rate, etc.), or demographic trends:

At the time of listing in 1991, *Lipochaeta lobata* var. *leptophylla* was known from two populations at Lualualei-Nanakuli Ridge and at Kolekole Pass containing 25 to 50 individuals (USFWS 1991). When the recovery plan was written in 1998, it was known from three populations (Lualualei-Nanakuli Ridge, Puu Hapapa, and Puu Kaua) containing about 142 individuals (USFWS 1998). In 2003, when critical habitat was designated, there were four populations noted at Lualualei-Nanakuli Ridge, Kauhiuhi, Puu Hapapa, Mikilua, and Kamaileunu Ridge with a total of 147 individuals (USFWS 2003).

According to a 2004 study of the naval facilities at Lualualei, more than 90 percent of *Lipochaeta lobata* var. *leptophylla* individuals occurred at the Naval Magazine Pearl Harbor, Lualualei Branch lands (Hawaii Natural Heritage Program 2004). Mikilua contained an estimate of 300 individuals of *L. lobata* var. *leptophylla*. At Lualualei via the Kolekole contour trail about 50 individuals were observed around the cliff at 661 meters (2,170 feet) elevation (Wood 2009).

In total, there may have been at least 182 individuals in four populations on Oahu observed from 1991 to 1999, instead of the 147 individuals reported when critical habitat was designated. However, since 2004, at least 350 individuals have been observed in only two populations on Oahu (Mikilua and Kolekole trail).

2.3.1.3 Genetics, genetic variation, or trends in genetic variation (e.g., loss of genetic variation, genetic drift, inbreeding, etc.):

No new information.

2.3.1.4 Taxonomic classification or changes in nomenclature:

In 1999, Wagner *et al.* determined that the subspecific ranking for this species should be subspecies, not variety, so the valid taxonomic name for the listed entity should be *Lipochaeta lobata* subsp. *leptophylla* (Wagner *et al.* 1999) and will be referred to the subspecific ranking throughout this document. In 2001, taxonomists placed some Hawaiian species of the genus *Lipochaeta* into the genus *Melanthera*, but this species is still properly referred to as *Lipochaeta lobata* subsp. *leptophylla* (Wagner and Robinson 2001). The taxonomic status of the subspecies of *L. lobata* in Lualualei Valley requires further study by plant taxonomists. Two specimens from the Kauhiuhi subdistrict were identified as subsp. *leptophylla* and another as subsp. *lobata*. The two varieties do not appear to be well differentiated (Hawaii Biodiversity and Mapping Program 2009; Hawaii Natural Heritage Program 2004).

2.3.1.5 Spatial distribution, trends in spatial distribution (e.g. increasingly fragmented, increased numbers of corridors, etc.), or historic range (e.g., corrections to the historical range, change in distribution of the species within its historic range, etc.):

See above section 2.3.1.2.

2.3.1.6 Habitat or ecosystem conditions (e.g., amount, distribution, and suitability of the habitat or ecosystem):

On Oahu, the habitat at Palikea Ridge in the Waianae Mountains where *Lipochaeta lobata* subsp. *leptophylla* was found in 1993 was lowland mesic forest and cliffs with *Bidens torta* (kookoolau), *Carex wahuensis* (no common name [NCN]), *Dubautia sherffiana* (naenae), *Elaphoglossum paleaceum* (makue), *Eragrostis variabilis* (kawelu), *Kadua cordata* (kopa), *Leptecophylla tameiameia* (pukiawe), and *Peperomia tetraphylla* (ala ala wai nui) (Wood 2009). Other habitat types in the Waianae Mountains where *Lipochaeta lobata* subsp. *leptophylla* was found, were degraded *Dodonea viscosa* lowland mesic shrublands with *Artemisia australis* (ahinahina), *Bidens torta*, *Carex meyenii* (NCN), *Chamaesyce (Euphorbia) celastroides* var. *amplectens* (akoko), *Eragrostis variabilis*, *Psydrax odorata* (alahee), *Santalum ellipticum* (iliahi), *Schiedea ligustrina* (NCN), *S. mannii* (NCN), and *Sida fallax* (ilima) (Perlman 2009). At Puu Hapapa the habitat was *Eragrostis variabilis* cliff vegetation with *Artemisia australis*, *Bidens torta*, *Carex meyenii*, *Melanthera tenuis*, *Lobelia niihauensis* (NCN), *Osteomeles anthyllidifolia* (ulei), *Schiedea hookeri* (NCN), *S. ligustrina*, and *Sida fallax* (Perlman 2009).

More recently in Lualualei, the habitat is secondary vegetation dominated by the introduced invasive plant species *Schinus terebinthifolius* (Christmasberry) and associated with native plants such as *Alyxia stellata* (maile), *Bidens torta*, *Chamaesyce (Euphorbia) multiformis* (akoko), *Doodia kunthiana* (okupukupu), *Dryopteris sandwicensis* (NCN), *Eragrostis variabilis*, *Psychotria mariniana* (kopiko), and *Myrsine lanaiensis* (kolea), adjacent to basalt cliffs with *Melanthera tenuis* (nehe), *Nototrichium humile* (kului), *Osteomeles anthyllidifolia*, *Panicum beecheyi* (NCN), *Pilea peploides* (NCN), *Schiedea hookeri*, and *S. ligustrina* (Wood 2009).

2.3.1.7 Other:

No new information.

2.3.2 Five-Factor Analysis (threats, conservation measures, and regulatory mechanisms)

2.3.2.1 Present or threatened destruction, modification or curtailment of its habitat or range:

On Oahu, feral pigs (*Sus scrofa*), goats (*Capra hircus*) are threats to the habitat of *Lipochaeta lobata* subsp. *leptophylla*. Feral goats are one of the main threats to the survival of rare plants in Lualualei. Several feral goats were seen in Puu Kaua during the 2004 survey (Hawaii Natural Heritage Program 2004). Threats from invasive introduced plants such as *Acacia farnesiana* (klu), *Bryophyllum pinnatum* (airplant), *Cenchrus ciliaris* (buffelgrass), *Chamaecrista nictitans* (partridge pea), *Grevillea robusta* (silk oak), *Lantana camara* (lantana), *Leucaena leucocephala* (haole koa), *Melinis minutiflora* (molasses grass), *Morella faya* (fire tree), *Opuntia* sp. (prickly pear cactus), *Passiflora suberosa* (corkystem passionflower), and *Stachytarpheta* sp. (Jamaican vervain) compete, shade, and crowd out native plants in the area (Perlman 2009; Wood 2009).

2.3.2.2 Overutilization for commercial, recreational, scientific, or educational purposes:

Not a threat.

2.3.2.3 Disease or predation:

Goats are reported to chew, trample, and knock down plants of *Lipochaeta lobata* subsp. *leptophylla* (Perlman 2009). Rats (*Rattus* spp.) and slugs (unidentified species) are also reported to eat or damage this species (Perlman 2009).

2.3.2.4 Inadequacy of existing regulatory mechanisms:

No new information.

2.3.2.5 Other natural or manmade factors affecting its continued existence:

Fires have occurred in the Waianae Mountains, and this threat would increase substantially if *Pennisetum setaceum* (fountain grass) were to become established in the area (Hawaii Natural Heritage Program 2004).

Climate change may also pose a threat to this species. However, current climate change analyses in the Pacific Islands lack sufficient spatial resolution to make predictions on impacts to this species. The Pacific Islands Climate Change Cooperative (PICCC) has currently funded climate modeling that will help

resolve these spatial limitations. We anticipate high spatial resolution climate outputs by 2013.

The Army's Wahiawa Nursery reported three plants of *Lipochaeta lobata* subsp. *leptophylla* growing in their nursery (U. S. Army 2008). Although the U.S. Navy has built protective fences around other endangered plant species at Lualualei, *L. lobata* subsp. *leptophylla* is not reported to be inside any of these fences (Hawaii Natural Heritage Program 2004).

2.4 Synthesis

Stabilizing, downlisting, and delisting objectives are provided in the recovery plan for the Oahu plants (USFWS 1998), based on whether the species is an annual, a short-lived perennial (fewer than ten years), or a long-lived perennial. *Lipochaeta lobata* subsp. *leptophylla* is a short-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 islands where they now occur or occurred historically. For the species to be considered stable, 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. There are only two populations currently known, only one population has more than 50 individuals (Table 1), and all threats are not being managed (Table 2). Therefore, *Lipochaeta lobata* subsp. *leptophylla* meets the definition of endangered as it remains in danger of extinction throughout its range.

Table 1. Status of *Lipochaeta lobata* subsp. *leptophylla* from listing through 5-year review.

Date	No. wild indivs	No. outplanted	Stability Criteria identified in Recovery Plan	Stability Criteria Completed?
1991 (listing)	25-50	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
1998 (recovery plan)	142	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2003 (critical habitat)	147	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)	>350	0	All threats managed in all 3 populations	No (Table 2)
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No: Only 2 populations, and only 1 of these with over 50 mature individuals

Table 2. Threats to *Lipochaeta lobata* subsp. *leptophylla*.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Ungulates – habitat modification and herbivory	A, C, D	Ongoing	No
Rats – herbivory	C	Ongoing	No
Slugs – herbivory	C	Ongoing	No
Fire	E	Ongoing	No
Invasive introduced plants	A, E	Ongoing	No
Climate change	A, E	Increasing	No

3.0 RESULTS

3.1 Recommended Classification:

Downlist to Threatened

Uplist to Endangered

Delist

Extinction

Recovery

Original data for classification in error

No change is needed

3.2 New Recovery Priority Number:

Brief Rationale:

3.3 Listing and Reclassification Priority Number:

Reclassification (from Threatened to Endangered) Priority Number: _____

Reclassification (from Endangered to Threatened) Priority Number: _____

Delisting (regardless of current classification) Priority Number:

Brief Rationale:

4.0 RECOMMENDATIONS FOR FUTURE ACTIONS

- Collect seeds from as many fruiting individuals as possible for long-term genetic storage and reintroduction.
- Construct large-scale fences around all naturally occurring and any future reintroduced individuals to control feral ungulates.
- Propagate for reintroduction into protected suitable habitat.
- Control invasive introduced plant species around existing populations.
- Control rats in the vicinity of these populations.
- Develop and implement methods to control slugs.
- Develop and implement fire management plans for each population.
- Work with U.S. Navy to initiate planning and contribute to implementation of ecosystem-level restoration and management to benefit this species.
- Update the listed entity on 50 CFR 17 to match the currently recognized taxonomy.
- Assess the modeled effects of climate change on this species, and use to determine future landscape needed for the recovery of the species.

5.0 REFERENCES

Hawaii Biodiversity and Mapping Program. 2009. Records for *Lipochaeta lobata* subsp. *leptophylla* from program database. University of Hawaii at Manoa, Honolulu, Hawaii.

Hawaii Natural Heritage Program. 2004. Center for Conservation Research and Training. Flora and fauna survey of Naval Magazine Pearl Harbor, Lualualei Branch, Lualualei Valley, Oahu, prepared for commander, Navy Region Hawaii. 101 pages. Unpublished.

Perlman, S. 2009. *Lipochaeta lobata* subsp. *leptophylla*. National Tropical Botanical Garden, Kalaheo, Hawaii. 2 pages. Unpublished.

[USFWS] U.S. Fish and Wildlife Service. 1991. Endangered and threatened wildlife and plants; determination of endangered status for 26 plants from the Waianae

Mountains, island of Oahu, Hawaii; final rule. Federal Register
56(209):55770-55786.

[USFWS] U.S. Fish and Wildlife Service. 1998. Recovery plan for Oahu plants. U.S. Fish and Wildlife Service, Portland, Oregon. 207 pages plus appendices. Available online at <<http://www.fws.gov/pacificislands/recoveryplans.html>>.

[USFWS] U.S. Fish and Wildlife Service. 2003. Endangered and threatened wildlife and plants; final designations or nondesignations of critical habitat for 101 plant species from the island of Oahu, Hawaii; final rule. Federal Register
68(116):35949-36406.

U. S. Army. 2008. Report to U.S. Fish and Wildlife Service on controlled propagation of listed and candidate species, as designated under the U.S. Endangered Species Act. 9 pages. Unpublished.

Wagner, W.L., D.R. Herbst, and S.H. Sohmer. 1999. Manual of the flowering plants of Hawaii, revised edition. University of Hawaii Press, Bishop Museum Press, Special Publication 97:1-1918.

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.

Wood, K.R. 2009. Notes on *Lipochaeta lobata leptophylla*. National Tropical Botanical Garden, Kalaheo, Hawaii. 2 pages. Unpublished.

Signature Page
U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW of *Lipochaeta lobata* var. *leptophylla* (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

Appropriate Listing/Reclassification Priority Number, if applicable: _____

Review Conducted By:

Chelsie Javar, Fish and Wildlife Biologist
Marie Bruegmann, Plant Recovery Coordinator
Jess Newton, Recovery Program Lead
Assistant Field Supervisor for Endangered Species

Field Supervisor, Pacific Islands Fish and Wildlife Office



Date 8/2/11