

5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Lipochaeta kamolensis* (Nehe)

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):

Holly Freifeld, Pacific Islands Fish and Wildlife Office, Fish and Wildlife Biologist
Marie 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
Gina Shultz, 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 March 8, 2007. The review was based on the proposed rule and final critical habitat designation for *Lipochaeta kamolensis* and other species from the island of Maui, as well as a review of current, available information (USFWS 2002, 2003). The Bernice P. Bishop Museum provided an initial draft of portions of the 5-year review and provided 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, and 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).

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 kamolensis* published in the Federal Register on May 14, 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. kamolensis*.

At the time we listed *Lipochaeta kamolensis* as endangered we followed the taxonomic treatment from Wagner *et al.* (1999). Subsequently, based on molecular and morphological analysis, Wagner and Robinson (2001) recognized some species of *Lipochaeta* from the sections (= groups of species less than an entire genus) *Aphanopappus* and *Wollastonia* to be synonyms of *Melanthera*. As such, *Lipochaeta kamolensis* has been transferred to the genus *Melanthera* and is now considered to be *Melanthera kamolensis*. Hereafter, for this review, the species will be referred to by its new name, *M. kamolensis*.

Historically *Melanthera kamolensis* was known from Kamole Gulch, west of Kepuni Gulch, and 7.2 kilometers (11.8 miles) southeast of Ulupalakua Ranch office. This species still occurs in Kamole Gulch, on State-owned (Department of Hawaiian Home Lands [DHHL]) land, but appears to be in decline. At the time of listing, the species extended over an area of about 40 hectares (100 acres) and was estimated to contain fewer than 500 individuals (USFWS 1992). An incomplete assessment by A.C. Medeiros and P. Kruschelnycky in 1994 (USFWS 1997) recorded 107 individuals in the Kamole Gulch population. In 2005, this population was observed as having only 25 mature individuals, and these were in moderate health (Plant Extinction Prevention Program 2007).

A second population of *Melanthera kamolensis* consisting of 50 to 100 individuals was discovered in 1994, covering an area of about 2 hectares (5 acres), about 4 kilometers (2.5 miles) west of the Kamole Gulch population on State-owned lands (Department of Hawaiian Home Lands) in Alena, just east of the Lualailua Hills, at about 600 meters (2,000 feet) elevation. This population appears to be a hybrid swarm of *M. kamolensis* and *M. rockii* (USFWS 1997). In 2005, this population was recorded as consisting of several clumps of about 50 individuals, with approximately 100 mature individuals (Plant Extinction Prevention Program 2007). The condition of the habitat is poor in both sites, with little native vegetation remaining, and sustains heavy impact from grazing cattle and alien vegetation (Hawaii Biodiversity and Mapping Program 2005; Plant Extinction Prevention Program 2007).

Melanthera kamolensis is a short-lived, low perennial herb in the aster family (Asteraceae). This species is distinguished from others of the genus by the simple leaves, which are pinnately lobed or cut, and by the size of the flower heads (Wagner *et al.* 1999). The species has been observed flowering from December through February, as well as in April. The growing season coincides with the wet season between November and April to May. Plants are deciduous and appear to be metabolically inactive during the dry season, which may impede population assessment (USFWS 2003).

Melanthera kamolensis typically grows in gulches or on gentle slopes outside gulches in dry shrubland at elevations between 40 and 602 m (132 and 1,974 ft) and containing one or more of the following associated native plant species: *Dodonaea viscosa* (aalii);

Ipomoea indica (koali awa); or *Plumbago zeylanica* (ilice) (USFWS 2003). Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors of *M. kamolensis* otherwise remain unknown (USFWS 2003).

The major threats to *Melanthera kamolensis* are habitat loss to development (Factor A), trampling by ungulates, fire, competition with nonnative plants (e.g., *Lantana camara* (lantana), *Melinis repens* (Natal redtop), and *Cenchrus ciliaris* (buffelgrass) in Kamole Gulch and *Neonotonia wightii* (no common name) in Alena) (Factor E), and predation by ungulates (Factor B) (USFWS 1992, 2003; PEP 2007). Cattle (*Bos taurus*) have been documented to trample and browse seedlings and mature plants (USFWS 1992). Goats (*Sus scrofa*) are a threat to the Kamole Gulch population, and deer remain a threat to the Alena hybrid swarm (Plant Extinction Prevention Program 2007). Fire is a particular threat to the persistence of the species (Factor E), as a single fire could extirpate either of the only known populations (USFWS 1997; Plant Extinction Prevention Program 2007).

In addition to the threats described above, species such as *Melanthera kamolensis* that have very small populations and are restricted 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 fires, hurricanes, landslides, flooding and disease outbreaks (Factor E). When considered on their own, the natural processes associated with being a single island endemic do not affect *M. kamolensis* 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. For example, a single fire could extirpate either of two known populations (USFWS 1997; Plant Extinction Prevention Program 2007).

The single pure population of *Melanthera kamolensis* has declined dramatically, with the current population size estimated at 25 mature individuals. The Alena hybrid population was fenced in 1995 to protect its population from feral animals (USFWS 1997). Cattle and goats were removed from the area, and hand-weeding was conducted. This population is estimated to harbor approximately 100 mature individuals, but the contribution of this hybrid swarm to the species' conservation and recovery is uncertain; therefore this population is not included in Table 1, below. The genetics of this population should be studied to determine if it is truly a hybrid or pure *M. kamolensis*. If the population is determined to be a hybrid, then its value to the conservation of *M. kamolensis* needs to be determined.

To safeguard the remaining genetic variation in this species, seed from the pure Kamole Gulch population has been collected and given to National Tropical Botanical Garden (2008). Although the species is easily propagated by seed and roots easily from cuttings (Lilleeng-Rosenberger 2005), to date, propagation has not been initiated.

Stabilizing, downlisting, and delisting objectives are provided in the Addendum to the Recovery Plan for Multi-island Species (USFWS 2002), based on whether the species is

an annual, a short-lived perennial (fewer than 10 years), or a long-lived perennial. *Melanthera kamolensis* is a short-lived perennial. Therefore 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* (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 Maui. Each of these populations must be naturally reproducing and increasing in number, with a minimum of 50 mature individuals per population.

The stabilization and recovery goals for this species have not been met, as only 25 individuals are known and no threats are being managed. Therefore, *Melanthera kamolensis* 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.
- Develop landowner commitment to protect remaining populations.
- Construct exclosures around the known populations as necessary to protect the species from ungulate trampling and browsing.
- Monitor competing alien plant species to determine impacts and control as necessary.
- Initiate planning and contribute to ecosystem-level management and restoration to benefit this species.
- Develop a fire management action plan with Maui Division of Forestry and Wildlife for protection of the species.
- Determine hybrid status of Alena population through genetic studies.
- Update the listed entity on 50 CFR 17 to match the currently recognized taxonomy.

References:

- Hawaii Biodiversity and Mapping Program. 2007. Program database. Hawaii Natural Heritage Program. University of Hawaii at Manoa, Honolulu, Hawaii.
- Lilleeng-Rosenberger, K.E. 2005. Growing Hawai'i's native plants. Mutual Publishing, Honolulu, HI.

- Plant Extinction Prevention Program. 2007. Annual performance report (July 1, 2006 to June 30, 2007), Plant Extinction Prevention (PEP) program for Oahu, Maui Nui, Hawaii. Unpublished.
- [USFWS] U.S. Fish and Wildlife Service. 1992. Endangered and Threatened Wildlife and Plants; Determination of Endangered of Threatened Status for 15 Plants From the Island of Maui, HI. Federal Register 57 (95): 20772-20788.
- [USFWS] U.S. Fish and Wildlife Service. 1997. Recovery plan for the Maui plant cluster (Hawaii). U. S. Fish and Wildlife Service, Portland, OR.
- [USFWS] U.S. Fish and Wildlife Service. 2002. Endangered and Threatened Wildlife and Plants; Revised Determinations of Prudency and Proposed Designations of Critical Habitat for Plant Species From the Islands of Maui and Kahoolawe, Hawaii. Federal Register 61 (64): 15855- 15987.
- [USFWS] U.S. Fish and Wildlife Service. 2003. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for 60 Plant Species from the Islands of Maui and Kahoolawe, HI: final rule. Federal Register 68 (93): 25934-25982
- Wagner, W.L., and H. Robinson. 2001. *Lipochaeta* and *Melanthera* (Asteraceae: Heliantheae subtribe Ecliptinae): establishing their natural limits and a synopsis. *Brittonia* 53:539-561.
- Wagner, W.L., D.R. Herbst, and S.H. Sohmer. 1999. Manual of the flowering plants of Hawaii, second edition. University of Hawaii Press and Bishop Museum Press, Honolulu, Bishop Museum Spec. Publ. 97:1-1853.

Table 1. Status of *Lipochaeta kamolensis* (Nehe) from listing through 5-year review.

Date	No. wild indivs	No. outplanted	Stability Criteria identified in Recovery Plan	Stability Criteria Completed?
1992 (listing)	< 500	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each (150 total)	Partially
1997 (recovery plan)	<200	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each (150 total)	No
2003 (critical habitat)	<500	0	All threats managed in all 3 populations	Unknown
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each (150 total)	Partially
2008 (5-year review)	25	0	All threats managed	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	Partially

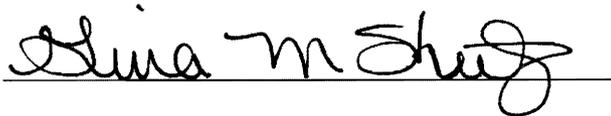
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SIGNATURE PAGE for 5-YEAR REVIEW of *Lipochaeta kamolensis* (Nehe)

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

Acting Field Supervisor, Pacific Islands Fish and Wildlife Office



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