

5-YEAR REVIEW
Short Form Summary
Species Reviewed: *Melanthera tenuifolia* (nehe)

Current Classification: Endangered

Federal Register Notice announcing initiation of this review:

[USFWS] U.S. Fish and Wildlife Service. 2022. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status reviews for 167 Species in Oregon, Washington, Idaho, Montana, California, Hawaii, Guam, and the Northern Mariana Islands. Federal Register 87(90):28031–28034, May 10, 2022.

Lead Region/Field Office:

Region 1/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, Recovery Program 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) beginning in October 2023. The review was based on a review of current, available information since the last 5-year review for *Melanthera tenuifolia* (USFWS 2019). The evaluation by Cheryl Phillipson, Biologist, was reviewed by Lauren Weisenberger, Plant Recovery Coordinator, and Megan Laut, Recovery Program 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 (<http://ecos.fws.gov/ecp/species/2407>).

Review Analysis:

Please refer to the previous 5-year reviews for *Melanthera tenuifolia* published in the Federal Register on August 2, 2011, as *Lipochaeta tenuifolia*, and September 30, 2019 (available at https://ecos.fws.gov/docs/tess/species_nonpublish/1741.pdf and https://ecos.fws.gov/docs/tess/species_nonpublish/2880.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 *M. tenuifolia*.

This short-lived perennial woody herb in the Asteraceae (sunflower) family is endangered and is known from the island of O‘ahu. The status and trends for *Melanthera tenuifolia* are provided in the tables below.

New Status Information:

- In 2012, we updated taxonomic information for this species, and revised the List of Endangered and Threatened Plants at 50 CFR 17.12 changing the genera from *Lipochaeta* to *Melanthera* (77 FR 57648, September 18, 2012). However, a taxonomic review by Orchard (2013, pp. 338, 388) transferred the Hawaiian species of *Lipochaeta* to *Wollastonia* based on geographical range and morphological characteristics. This change is accepted in the Smithsonian Institution’s Hawaiian Flora Checklist (2024, <https://naturalhistory2.si.edu/botany/hawaiianflora/>) and does not change the range or listing status of the species. Other research indicated that this species could be transferred back to *Lipochaeta* (Edwards et al. 2018), but this change is not accepted by the Smithsonian Institution. We will address the change to *Wollastonia* in a future technical report.
- There were estimated to be 1,721 mature and 411 immature wild plants in six populations (Keawa‘ula, Kaluakauila, ‘Ōhikilolo, Manuwai, Mākaha-Kamaile‘unu, and Wai‘anae Kai) in the Wai‘anae mountains of O‘ahu. Unfortunately, most population units have not been monitored recently, and many populations sites show substantial decline over the last ten years (Plant Extinction Prevention Program [PEPP] 2019–2023; Army Natural Resources Program of O‘ahu [ANRPO] 2023a appendices, p. 324; ANRPO 2023b). Therefore, the current total population size for this species is unknown and declining.
- Twenty-three founders from three populations (one of which consists of three subpopulations) at Manuwai, Mākaha, and ‘Ōhikilolo are represented by explants and mature propagated plants (ANRPO 2023b; Lyon Arboretum 2022; Native Ecosystems Protection and Management Program [NEPM] 2020).

New Threats:

- In 2022, a fire in Makua valley burned 133 acres (54 ha) and came within 328 feet (100 meters) of a populations of *Melanthera tenuifolia* at ‘Ōhikilolo and Mākaha (ANRPO 2022, p. viii, appendices pp. 97, 106).

New Management Actions:

- Monitoring—At some point historically or recently almost one-third of ANRPO’s population units for this species met stabilization requirements for mature plants; therefore, ANRPO has prioritized management of cliff habitat that also includes populations of *Melanthera tenuifolia* (ANRPO 2022, p. 100; ANRPO 2023a, p. 115).
- Feral ungulate monitoring and control—The ANRPO conducts feral ungulate control at Kahanahāiki, Kaluakauila, and ‘Ōhikilolo (ANRPO 2020 appendices, p. 411; ANRPO 2021 appendices, p. 394; ANRPO 2022 appendices, p. 508; ANRPO 2023 appendices, p. 367). Populations at Kaluakauila, ‘Ōhikilolo, and Manuwai are protected by fencing, and partially protected at Mākaha by fencing.
- Nonnative invasive plant control—ANRPO controls nonnative invasive plants at Mt. Ka‘ala NAR (ANRPO 2021 appendices, p. 394; ANRPO 2022 appendices, p. 508; ANRPO 2023 appendices, p. 367).
- Collection and propagation for genetic storage and reintroduction—

- Lyon Arboretum reported propagation of 194 explants representing seven founders from one population at ‘Ōhikilolo. Attempts to propagate material from Manuwai and Mākaha were not successful (Lyon Arboretum 2022).
- From 2020 to 2022, ANRPO met genetic storage goals for the population at Kaluakauila; however, in 2023 representation dropped to 75 percent (ANRPO 2020 appendices, p. 450; ANRPO 2021 appendices, p. 433; ANRPO 2023a appendices, p. 407). In 2022, ANRPO reported that seven founders were represented in micropropagation; in 2023, there were six founders represented and, because of poor performance when kept in micropropagation, ANRPO will alternatively collect from the established living collection instead (ANRPO 2022, p. 111, appendices p. 547; ANRPO 2023a, p. 126). In 2023, ANRPO added 11 founders to the West Base Interpretive Garden as a living collection (ANRPO 2023a, p. 113). In 2023, the ANRPO plant nursery reported propagation of 65 explants representing 22 founders from three populations at Manuwai, Mākaha, and ‘Ōhikilolo (ANRPO 2023b).
- In 2020, the Native Ecosystems Protection and Management Program [NEPM] reported storage of 145 apical samples representing six founders at the Mākaha and ‘Ōhikilolo populations (NEPM 2020).
- In 2018, the Waimea Arboretum reported propagation of three plants representing one founder from an unspecified source (Waimea Arboretum 2018).

Table 1. Status and trends of *Melanthera tenuifolia* from listing through current 5-year review. Table 1a shows progress according to Interim Stabilization Goals; Table 1b shows progress according to Preventing Extinction Goals.

Table 1a.

Date	No. wild individuals	No. Outplanted	Downlisting Criteria identified in Recovery Plan	Downlisting Criteria Completed?
1991 (listing)	400–600	0	All threats managed in all 5–7 populations	No
			Naturally reproducing, stable or increasing in number	Unknown
			5–7 populations with 300 mature individuals each	Unknown
2011 (5-year review)	2,579	0	All threats managed in all 5–7 populations	Partial
			Naturally reproducing, stable	Partial

			or increasing in number	
			5-7 populations with 300 mature individuals each	Partial, 3 populations >300

Table 1b.

Date	No. wild individuals	No. outplanted	*Preventing Extinction Targets identified by HPPRCC	*Preventing Extinction Targets Completed?
2019 (5-year review)	2,100	0	All threats managed in all 6 populations	Partial
			Complete genetic storage	Partial
			Reproduction (i.e., viable seeds, seedlings) at all 6 populations	Unknown
			6 populations with 50 mature individuals each	Partial, possibly complete
2024 (5-year review)	Unknown	0	All threats managed in all 6 populations	Partial, feral ungulate control and fencing at 4 populations; nonnative plant control at 1 population
			Complete genetic storage	Partial, 23 founders representing 3 populations
			Natural reproduction at all 6 populations	Partial
			6 populations with 50 mature individuals each	Partial, current census data needed

* 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 *Melanthera tenuifolia* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Feral ungulate destruction and degradation of habitat	A	Ongoing	Partial, 4 populations in fenced areas
Established ecosystem altering invasive plant species destruction and degradation of habitat and competition	A, E	Ongoing	Partial, 1 population in managed area
Fire destruction and degradation of habitat	A	Ongoing	Partial, fire management plan and coordinated control efforts
Climate change degradation or loss of habitat	A	Ongoing	None
Rodent predation and herbivory	C	Ongoing	None specifically for <i>Melanthera tenuifolia</i>
Invertebrate predation and herbivory	C	Ongoing	None

Synthesis:

Currently, estimates are unknown but may total fewer than 2,000 individuals in six populations at Keawa‘ula, Kaluakauila, ‘Ōhikilolo, Manuwai, Mākaha-Kamaile‘unu, and Wai‘anae Kai. Four of these populations total more than 50 mature individuals. Three populations are within fenced areas and a fourth is partially fenced. Nonnative plant control is ongoing in one area. Twenty-three founders from three populations are represented in propagation.

Stabilizing (interim), and downlisting and delisting criteria are provided in the Recovery Plan for the O‘ahu Plants (USFWS 1998) and preventing extinction targets have been added and criteria 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.

Melanthera tenuifolia is a short-lived, perennial, woody herb with vegetative reproduction. 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 six populations should be documented on O‘ahu where they now occur 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 *Melanthera tenuifolia* have not been met. The number of wild individuals continues to decline. Only three populations are within an enclosure, and a fourth is partially fenced. Nonnative invasive plant control is conducted at one location (Table 1, Table 2). Only 23 founders from three populations are represented propagation with no seed collections or reintroductions (Table 1). Predation by rodents and invertebrates, and climate change, are not addressed (Table 2). Therefore, *M. tenuifolia* meets the definition of Endangered as it remains in danger of extinction throughout its range.

Recommendations for Future Actions:

No significant new information regarding the species’ biological status has been reported since the last 5-year review in 2019. Thus, the following recommendations for future actions are updated or reiterated for the 5-year review for 2024.

- Surveys and monitoring—Continue monitoring known populations of *Melanthera tenuifolia*.
- Feral ungulate monitoring and control—Continue to monitor enclosures and fence all known populations to provide protection from the negative impacts of feral ungulates.
- Nonnative invasive plant monitoring and control—Continue to control established ecosystem-altering nonnative invasive plant species, and those that compete with *Melanthera tenuifolia*, at all populations where possible.
- Fire monitoring and control—Implement fire management plans and continue to coordinate fire response efforts.
- Climate change adaptation strategy—Assess the modeled effects of climate change on this species and use to determine future landscape needed for its recovery.
- Rodent monitoring and control—Implement effective control for rodents at all populations where possible.
- Invertebrate monitoring and control—Develop and implement effective control methods for slugs at populations where necessary.
- Captive propagation for genetic storage and reintroduction—Continue collection and propagation efforts for maintenance of genetic stock and for reintroduction.
- Build resiliency, redundancy, and representation—Increase species’ viability through habitat restoration, threat control, and reintroduction and translocation to reduce impacts of predation and herbivory by rodents and invertebrates, wildfires, and climate change.
- Taxonomic change—Update the 50 CFR at 17.12 to reflect the change of genera from *Melanthera* to *Wollastonia* when accepted.

- Alliance and partnership development—Continue to work with ANRPO, NEPM, PEPP, and other land managers and partners to initiate planning and contribute to implementation of ecosystem-level restoration and management to benefit this species.

References:

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- [ANRPO] 2023a. 2023 Status report for the Mākua and O‘ahu Implementation Plans, Prepared by Army Natural Resources Program, O‘ahu, Office of the Vice President for Research and Innovation, University of Hawai‘i. 255 pp., appendices 534 pp.
- [ANRPO] 2023b. Report on controlled propagation of listed species, as designated under the U.S. Endangered Species Act. Unpublished report submitted to the U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office, Honolulu, Hawai‘i.
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U.S. FISH AND WILDLIFE SERVICE
SIGNATURE PAGE for 5-YEAR REVIEW of *Melanthera tenuifolia* (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 _____