

5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Melanthera kamolensis* (nehe)

Current Classification: Endangered

Federal Register Notice announcing initiation of this review:

[USFWS] U.S. Fish and Wildlife Service. 2021. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status reviews for 77 Species in Oregon, Washington, Idaho, and Hawaii. Federal Register 86(120):33726–33728, June 25, 2021.

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, Acting Recovery 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) beginning in October 2022. The review was based on a review of current, available information since the last 5-year review for *Melanthera kamolensis* (USFWS 2018). The evaluation by Cheryl Phillipson, Biologist, was reviewed by Lauren Weisenberger, Plant Recovery Coordinator, and Acting Recovery 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 (<http://ecos.fws.gov/ecp/species/3476>).

Review Analysis:

Please refer to the previous 5-year reviews for *Melanthera (Lipochaeta) kamolensis* published in the Federal Register on July 23, 2009, March 27, 2014, and October 23, 2018 (available at https://ecos.fws.gov/docs/tess/species_nonpublish/1388.pdf, https://ecos.fws.gov/docs/tess/species_nonpublish/2194.pdf and https://ecos.fws.gov/docs/tess/species_nonpublish/2644.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. kamolensis*.

This short-lived perennial herb in the Asteraceae (sunflower) family is endangered and occurs on the south slopes of Haleakalā (east Maui). The status and trends for *Melanthera kamolensis* are provided in the tables below.

New Status Information:

- Currently, there is one wild population of one individual of *Melanthera kamolensis* at Luaala‘ilua on Haleakalā (east Maui) (Maui Plant Extinction Prevention Program [Maui PEPP] 2020). Other occurrences at Luaala‘ilua, Kepuni Gulch, and Alena are possible hybrids with *M. rockii* totaling fewer than 100 individuals (Maui PEPP 2016, 2020). Samples have been taken for genetic analysis (Maui PEPP 2020).
- In 2015, we updated taxonomic information for this species, changing the genera from *Lipochaeta* to *Melanthera* (USFWS 2015). However, a study by Orchard (2013, pp. 338, 388) transferred the Hawaiian species of *Lipochaeta* to *Wollastonia* based on geographical range and morphological characteristics. This change is currently accepted in the Smithsonian’s Hawaiian Flora Checklist (2022, <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*, but this change is not accepted by the Smithsonian (Edwards et al. 2018). We will address the change to *Wollastonia* in a future technical report.
- Currently, there are at least four founders (wild plants) from one population at Luaala‘ilua, represented in *ex situ* storage and propagation. Pure founders may be represented at a translocation site at Kanaio.

New Threats:

- None reported.

New Management Actions:

- Monitoring and surveys—Maui PEPP monitors the wild and translocated populations of *Melanthera kamolensis* on Haleakalā (Oppenheimer and Severson 2020a, 2020b, Oppenheimer 2020a; Maui PEPP 2020, 2021).
- Ungulate monitoring and control—The translocated subpopulations at Kanaio are within an ungulate-free enclosure (PEPP 2019, p. 15; Oppenheimer and Severson 2020a, 2020b; Oppenheimer 2020). Maui PEPP also monitors and repairs and retrofits fencing at Luaala‘ilua (Maui PEPP 2016, 2020).
- Invasive nonnative plant monitoring and control—Maui PEPP conducts invasive nonnative plant control at the wild population at Luaala‘ilua and the Kanaio translocated subpopulations (Oppenheimer and Severson 2020a, 2020b; Oppenheimer 2020).
- Drought monitoring and control—Maui PEPP monitors and waters translocated plants and installs and maintains water catchment systems (Oppenheimer and Villalon 2020; Maui PEPP 2019, 2020, 2021).
- Collection and propagation for genetic storage and translocation—
 - In 2019, the Olinda Rare Plant Facility (ORPF) reported propagation of eight plants representing at least one individual from the mixed wild and hybrid population at Luaala‘ilua (ORPF 2019, 2020). Currently, one plant remains in storage (ORPF 2023).

- In 2019, the Lyon Arboretum Seed Conservation Laboratory reported storage of 352 seeds representing three individuals of a mixed population of wild founders and translocated plants at Luala‘ilua (Lyon Arboretum 2022).
- In 2017, Maui PEPP collected seeds for storage at Lyon Arboretum from four founders at Luala‘ilua (Maui PEPP 2017). Maui PEPP also collected material for genetic analysis to determine which individuals or populations are pure or are hybrids with *M. rockii* (Maui PEPP 2020).
- Reintroductions, augmentations, translocation—
 - From 2018 to 2021, Maui PEPP translocated 61 individuals in three subpopulations within a fenced area at Kanaio; currently, 10 survive in one subpopulation (PEPP 2018, p. 29, 2019, p. 27, 2021, p. 10; Oppenheimer and Severson 2020a, 2020b, Oppenheimer 2020; Maui PEPP 2020). Some recruitment has been observed (Maui PEPP 2021).

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

Date	No. wild individuals	No. outplanted	Stability Criteria identified in Recovery Plan	Stability Criteria Completed?
1992 (listing)	several 100	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	Partially
2009 (5-year review)	25	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2014 5-year review	30–40	0	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No

Date	No. wild individuals	No. outplanted	*Preventing Extinction Criteria identified by HPPRCC	*Preventing Extinction Criteria Completed?
2018 (5-year review)	1	>50	All threats managed in all 3 populations	No
			Reproduction (i.e., viable seeds, seedlings, saplings) at all 3 populations	No
			Complete genetic storage	Partially, 13 founders represented
			3 populations with 50 mature individuals each	No
2023 (5-year review)	1	61, 10 survive	All threats managed in all 3 populations	Partially, 2 populations fenced with nonnative plant control
			Complete genetic storage	Partially
			Natural reproduction at all 3 populations	Partially, recruitment observed at 1 translocated population
			3 populations with 50 mature individuals each	No

* 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 kamolensis* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Degradation and destruction of habitat by feral ungulates	A	Ongoing	Partial, 2 populations fenced

Established ecosystem altering invasive plant species degradation of habitat	A	Ongoing	Partial, nonnative plant control at all populations
Landslides and flooding destruction and degradation of habitat	A	Ongoing	None
Drought destruction and degradation of habitat	A	Ongoing	Partial, water catchments at translocated populations
Fire destruction and degradation of habitat	A	Ongoing	None
Climate change degradation or loss of habitat including hurricanes	A	Ongoing	None
Predation and herbivory by feral ungulates	C	Ongoing	Partial, 2 populations fenced
Reduced viability due to low numbers	E	Ongoing	Partial, seed collection, propagation, and translocation ongoing

Synthesis:

Currently, there is one pure wild individual of *Melanthera kamolensis* and two groups of mixed wild/hybrid plants totaling fewer than 100 individuals on Haleakalā. There are three subpopulations of translocated plants within an enclosure at Kanaio. At least four founders are currently represented in seed collections and propagation. Translocation is ongoing, with more than 60 individuals reintroduced; however, only 10 currently survive. Recruitment has been observed at one translocated subpopulation.

Stabilizing (interim), downlisting, and delisting objectives are provided in the Recovery Plan for the Maui Plant Cluster (Hawaii) (U.S. Fish and Wildlife Service 1997) 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.

Melanthera kamolensis 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 Maui 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 this species have not been met as there are no populations of at least 50 mature individuals (Table 1). At least four founders are currently represented in collections (Table 1). All threats, including landslides, drought, fire, and hybridization, are not sufficiently managed throughout the range of the species (Table 1, Table 2). Four subpopulations were translocated; however, survival is low. Therefore, *Melanthera kamolensis* 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 2018. Thus, the following recommendations for future actions are added or reiterated for the 5-year review for 2023.

- Surveys and inventories—Continue to survey for additional populations of *Melanthera kamolensis* in areas of potentially suitable habitat and assess the current status of known populations.
- Ungulate monitoring and control—Continue to construct and maintain exclosures, or strategic fencing as appropriate, to protect *M. kamolensis* from the negative impacts of feral ungulates.
- Invasive nonnative plant monitoring and control—Continue control of established ecosystem-altering nonnative invasive plant species, and those that compete with *M. kamolensis*, at all populations.
- Fire prevention and control—Develop and implement fire management plans for all wild and translocated populations.
- Climate change adaptation strategy—Assess the modeled effects of climate change on this species and use this information to determine future landscape needed for recovery of the species.
- Captive propagation for genetic storage and reintroduction—Continue collection and propagation efforts for maintenance of genetic stock and for translocation.
- Translocation and augmentation—Continue to translocate individuals into suitable habitat within historic range that is being managed for known threats to this species.
- Genetic research—Conduct research on hybrid populations to confirm hybrid status between *M. kamolensis* and *M. rockii*.
- Build resiliency, redundancy, and representation—Continue translocation of individuals into suitable habitat that is being managed for known threats to this species to reduce impacts of landslides, , and drought.
- 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 taxon.

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U.S. FISH AND WILDLIFE SERVICE
SIGNATURE PAGE for 5-YEAR REVIEW of *Melanthera 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

For Field Supervisor, Pacific Islands Fish and Wildlife Office

_____ Date _____