5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Remya montgomeryi* (no common name)

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:

Daniel Adamski, 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) beginning in October 2021. The review was based on a review of current, available information since the last 5-year review for *Remya montgomeryi* (USFWS 2017). The evaluation by Daniel Adamski, 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/4032*).

Review Analysis:

Please refer to the previous 5-year reviews for *Remya montgomeryi* published in the Federal Register on August 27, 2010 (available at *https://ecos.fws.gov/docs/tess/species_nonpublish/1651.pdf*) and September 18, 2017 (available at *https://ecos.fws.gov/docs/tess/species_nonpublish/2502.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 *R. montgomeryi*.

This short-lived perennial shrub in the Asteraceae (sunflower) family is endangered and is known from the island of Kaua‘i. The status and trends for *Remya montgomeryi* are provided in the tables below.

New Status Information:

- At the time of the last 5-year review in 2017, *Remya montgomeryi* was known from one population at Kalalau on Kaua‘i. The population was surveyed in 2018; no wild plants were observed, and the area was overgrown with invasive weeds (Kishida and Perlman 2018a). Recently, surveys conducted using an Unmanned Aerial Vehicle (UAV) discovered one individual present at the only known extant population in Kalalau (Nyberg 2020).

New Threats:

- None.

New Management Actions:

- Invasive nonnative plant management—Plant Extinction Prevention Program (PEPP) conducts invasive weed control while monitoring an outplanting population in a fenced exclosure at Kalalau (Kishida and Perlman 2018b).
- Collection and propagation for genetic storage and reintroduction—
  - Kōke‘e Mid-elevation Nursery (KMEN) reported no plants in propagation or seeds in storage for *Remya montgomeryi* (KMEN 2021).
  - Lyon Arboretum reports 87,095 seeds in storage representing 11 founders (Lyon Arboretum 2022).
  - National Tropical Botanical Garden (NTBG) reported an unknown number of seeds from at least two plants in cultivation at the Garden, one originally sourced from Kalalau and another sourced from Koai‘e (NTBG 2021).
- Reintroduction and translocation—PEPP monitors the only reintroduced population at Kahuama‘a Flats (Kishida and Perlman 2018b).

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

Date	No. wild individuals	No. outplanted	Stability Criteria identified in Recovery Plan	Stability Criteria Completed?
1991 (listing)	<50	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
1995 (recovery plan)	55-75	0	All threats managed in all 3 populations	No

			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2003 (critical habitat)	142	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)	18	0	All threats managed in all 3 populations	No
			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?**
2017 (5-year review)	5	14	All threats managed in all 3 populations	No
			Reproduction (i.e., viable seeds, seedlings, saplings) at all three populations	Unknown
			Complete genetic storage	Almost complete
			3 populations with 50 mature individuals each	No
2022 (5-year review)	1	10	All threats managed in all 3 populations	No
			Complete genetic storage	Almost complete, need new plant if accessible

			Natural reproduction at all 3 populations	Unknown
			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 *Remya montgomeryi* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Degradation and destruction of habitat by feral ungulates	A	Ongoing	Partial, a few individuals within fenced exclosure
Established ecosystem altering invasive plant species degradation of habitat	A	Ongoing	None
Climate change degradation or loss of habitat, including hurricanes	A	Ongoing	None
Degradation and destruction by landslides	A	Ongoing	None
Degradation and destruction by fire	A	Ongoing	None
Predation and herbivory by ungulates	C	Ongoing	Partial, a few individuals within fenced exclosure
Predation and herbivory by rodents	C	Ongoing	None
Reduced viability due to low numbers	E	Ongoing	Partial, seed collections

Synthesis:
Currently, there is one known wild individual of *Remya montgomeryi* on Kaua‘i. Seed collections and reintroductions are ongoing, where the reintroduced plants are in ungulate exclosures.

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.

Remya montgomeryi is a short-lived perennial shrub. 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 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. There is only a single known extant individual, and that individual still needs *ex situ* representation if it is accessible (as located in vertical cliffs) (Table 1), and all threats are not being managed (Table 1, Table 2). Therefore, *Remya montgomeryi* 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 2017. Thus, the following recommendations for future actions are reiterated updated for the 5-year review for 2022.

- Surveys and inventories—
  - Survey for populations of *Remya montgomeryi* in areas of potentially suitable habitat.
  - Determine if historical populations are extirpated.
  - Determine sites that have the highest likelihood of maintaining reintroductions.
- Ungulate monitoring and control—Continue to maintain fenced exclosures to protect individuals from the negative impacts of browsing by ungulates.
- Invasive nonnative plant monitoring and control—Continue control of established ecosystem-altering nonnative invasive plant species, and those that compete with *Remya montgomeryi*.
- Site and habitat protection—Develop and implement effective control measures to reduce the impacts of landslides.
- Fire prevention and control—Continue to develop and implement fire prevention management plans.
- Climate change adaptation strategy—Research suitability of habitat for reintroduction of this species in the future due to the impacts of climate change, including hurricanes.
- Captive propagation for genetic storage and reintroduction—Initiate propagation efforts for maintenance of genetic stock and for reintroduction.
- Reintroduction and translocation—Continue to reintroduce individuals into suitable habitat that is being managed for known threats to this species to build

resiliency and redundancy to reduce the impacts of climate change, stochastic events, and reduced viability due to small population size.

- Population biology research—
  - Determine which species may act as pollinators and which may assist with fruit dispersal.
  - Conduct genetic studies to determine genetic variation within the population and plan an effective breeding program.
- 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:

[HPPRCC] Hawai‘i and Pacific Plants Recovery Coordinating Committee. 2011. Revised recovery objective guidelines. 8 pp.

Kishida, W., and S. Perlman. 2017a. Hawai‘i Rare Plant Restoration Group (HRPRG) Field Data Form in PEPP 2019: Plant Extinction Prevention Program, FY 2019 Annual Report (Oct 1, 2018-Sep 30, 2019), USFWS CFDA Program #15.657, Endangered Species Conservation-Recovery Implementation Funds, Coop Agreement F18AC00502, December 26, 2019, UH Mānoa, PCSU, PEPP. 192 pp. + appendices. BioPacifica database record for *Remya montgomeryi*, Pacific Islands Fish and Wildlife Office.

Kishida, W., and S. Perlman. 2017a. Hawai‘i Rare Plant Restoration Group (HRPRG) Field Data Form in PEPP 2019: Plant Extinction Prevention Program, FY 2019 Annual Report (Oct 1, 2018-Sep 30, 2019), USFWS CFDA Program #15.657, Endangered Species Conservation-Recovery Implementation Funds, Coop Agreement F18AC00502, December 26, 2019, UH Mānoa, PCSU, PEPP. 192 pp. + appendices. BioPacifica database record for *Remya montgomeryi*, Pacific Islands Fish and Wildlife Office.

[KMEN] Kōke‘e Mid-Elevation Nursery. 2021. 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.

Lyon Arboretum. 2022. 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.

[NTBG] National Tropical Botanical Garden. 2021. 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.

Nyberg, B. 2020. Endangered surveys using unmanned aerial vehicle. National Tropical Botanical Garden, Kalaheo. Unpublished report submitted to the U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office, Honolulu, Hawai‘i. 10 pp.

Perlman, S., and W. Kishida. 2015. Hawai‘i Rare Plant Restoration Group (HRPRG) Field Data Form in PEPP 2019: Plant Extinction Prevention Program, FY 2019 Annual Report (Oct 1, 2018-Sep 30, 2019), USFWS CFDA Program #15.657, Endangered Species Conservation-Recovery Implementation Funds, Coop Agreement F18AC00502, December 26, 2019, UH Mānoa, PCSU, PEPP. 192 pp. + appendices. BioPacifica database record for *Remya montgomeryi*, Pacific Islands Fish and Wildlife Office.

[USFWS] U.S. Fish and Wildlife Service. 2010. *Remya montgomeryi* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. *https://ecos.fws.gov/docs/tess/species_nonpublish/1651.pdf.*

[USFWS] 2017. *Remya montgomeryi* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. *https://ecos.fws.gov/docs/tess/species_nonpublish/2502.pdf.*

[USFWS] 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.

[USFWS] 2021. Kaua‘i Islandwide Recovery Plan. U.S. Fish and Wildlife Service, Portland, OR. 65 pp. + appendices.

U.S. FISH AND WILDLIFE SERVICE

SIGNATURE PAGE for 5-YEAR REVIEW of *Remya montgomeryi* (no common name)

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
___X_____ No Change in listing status

For **Field Supervisor, Pacific Islands Fish and Wildlife Office**

MEGAN LAUT Digitally signed by MEGAN LAUT
Date: 2022.08.08 14:52:59 -10'00'

_____ Date_____