

5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Remya mauiensis* (Maui remya)

Current Classification: Endangered

Federal Register Notice announcing initiation of this review:

USFWS] U.S. Fish and Wildlife Service. 2012. Endangered and threatened wildlife and plants; 5-year status reviews of 46 species in Idaho, Oregon, Washington, Nevada, Montana, Hawaii, Guam, and the Northern Mariana Islands. Federal Register 77(44):13248-13251

Lead Region/Field Office:

Region 1/Pacific Islands Fish and Wildlife Office (PIFWO), Honolulu, Hawaii

Name of Reviewer(s):

Ian Bordenave, Fish and Wildlife Biologist, PIFWO

Maui Nui and Hawaii Island Team Manager, PIFWO

Marie Bruegmann, Plant Recovery Coordinator, PIFWO

Recovery Program Lead, PIFWO

Kristi Young, Programmatic Deputy Field Supervisor, PIFWO

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 6, 2012. The review was based on a review of current, available information since the last 5-year review for *Remya mauiensis* (USFWS 2009). The evaluation of Ian Bordenave, Fish and Wildlife Biologist, was reviewed by the Island Team Manager, and Plant Recovery Coordinator, followed by the Recovery Program Lead. It was subsequently reviewed and approved by the Programmatic Deputy Field Supervisor.

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).

Review Analysis:

Please refer to the previous 5-year review for *Remya mauiensis* published on July 23 2009 (available at http://ecos.fws.gov/docs/five_year_review/doc2436.pdf) for a complete review of the species' status, threats, and management efforts. 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 *R. mauiensis*.

This short-lived perennial shrub is endangered and occurs on the island of Maui (USFWS 1997). The current status and trends for *Remya mauiensis* are provided in the tables below.

New status information:

In addition to those populations cited in the previous 5-year review, new observations include the following:

- In 2011, the Plant Extinction Prevention Program [PEPP] (2011) reported there were 156 mature individuals and 3 seedlings of *R. mauiensis*.
- The proposed listing and critical habitat rule stated that *R. mauiensis* is found in 6 locations totaling approximately 500 individuals at Kauaula, Puehuhunui, Ukumehame, Papalaua, Pohakea, and Manawainui (USFWS 2012).

Overall, *Remya mauiensis* has increased from 156 individuals reported in the last 5-year review to approximately 500 individuals (USFWS 2012).

New threats:

- Climate change degradation of habitat – Climate change may pose a threat to this species. Fortini *et al.* (2013) conducted a landscape-based assessment of climate change vulnerability for native plants of Hawaii using high resolution climate change projections. Climate change vulnerability is defined as the relative inability of a species to display the possible responses necessary for persistence under climate change. The assessment by Fortini *et al.* (2013) concluded that *R. mauiensis* is highly vulnerable to the impacts of climate change. Furthermore, *R. mauiensis* was identified as a species that will have no overlapping area between current and future climate envelope (areas that contain the full range of climate conditions under which the species is known to occur) by 2100. Therefore, additional management actions are needed to conserve this taxon into the future.

New management actions:

- Captive propagation for genetic storage and reintroduction
 - The Harold L. Lyon Arboretum Seed Conservation Laboratory (2013) contains approximately 16,500 seeds in genetic storage.
 - The National Tropical Botanical Garden (2013) has approximately 6,000 seeds in genetic storage.
 - There are two seeds in genetic storage at the Maui Nui Botanical Gardens (2012).
- Listing and critical habitat designation – Twenty-one units of unoccupied and occupied areas of critical habitat for *R. mauiensis* was proposed in the lowland dry, lowland mesic, lowland wet, montane mesic, and wet cliff ecosystems on Maui (USFWS 2012). The final rule for critical habitat designations has not been published at the time of this review.

Synthesis:

Stabilizing, downlisting, and delisting objectives are provided in the recovery plan for the Maui plant cluster (USFWS 1997), based on whether the species is an annual, a short-lived perennial (fewer than 10 years), or a long-lived perennial. *Remya mauiensis* is a short-lived perennial, and to be considered stable, this species 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 Maui. Each of these populations must be

naturally reproducing and increasing in number, with a minimum of 50 mature individuals per population. There are three populations containing more than 50 mature individuals each, but the other stabilization criteria have not been met.

For downlisting, a total of five to seven populations of *Remya mauiensis* should be documented on Maui where it now occurs or occurred historically. 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.

The downlisting goals for this species have not been met, as no population of 300 mature individuals exists (Table 1), and all threats are not being sufficiently managed throughout its range (Table 2). Therefore, *Remya mauiensis* meets the definition of endangered as it remains in danger of extinction throughout its range.

Recommendations for Future Actions:

- Captive propagation for genetic storage and reintroduction
 - Continue collection of genetic resources for storage, propagation, and reintroduction into protected suitable habitat within historical range.
 - Evaluate genetic resources currently in storage to determine the need to place additional genetic resources in long-term storage due to this species' vulnerability to climate change.
- Reintroduction / translocation – Augment current natural populations to increase numbers of individuals.
- Ungulate monitoring and control – Fence remaining populations to protect them from the impacts of feral ungulates.
- Invasive plant monitoring and control – Control invasive introduced plant species within the vicinity of all known populations of *R. mauiensis*.
- Population viability monitoring and analysis – Continue monitoring activities for all known populations of *R. mauiensis*.
- Climate change adaptation strategy – Research the suitability of habitat for reintroducing this species in the future due to the impacts of climate change.
- Alliance and partnership development – Initiate planning and contribute to implementation of ecosystem-level restoration and management to benefit this taxon.

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

Date	No. wild individuals	No. outplanted	Downlisting Criteria identified in Recovery Plan	Downlisting Criteria Completed?
1991 (listing)	9	0	5-7 populations with minimum of 300 mature individuals each	No
			Populations naturally reproducing, stable and increasing in numbers	No
			Populations secure from threats	Partially
			Populations persisting for a minimum of 5 years	No
1997 (recovery plan)	9	0	5-7 populations with minimum of 300 mature individuals each	No
			Populations naturally reproducing, stable and increasing in numbers	No
			Populations secure from threats	Partially
			Populations persisting for a minimum of 5 years	No
2003 (critical habitat)	21	0	5-7 populations with minimum of 300 mature individuals each	No
			Populations naturally reproducing, stable and increasing in numbers	No
			Populations secure from threats	Partially
			Populations persisting for a minimum of 5 years	No
2009 (5-year review)	At least 320	0	5-7 populations with minimum of 300 mature individuals each	No
			Populations naturally reproducing, stable and increasing in numbers	Partially
			Populations secure from threats	Partially

Date	No. wild individuals	No. outplanted	Downlisting Criteria identified in Recovery Plan	Downlisting Criteria Completed?
			Populations persisting for a minimum of 5 years	No
2012 (critical habitat – proposed)	~ 500	0	5-7 populations with minimum of 300 mature individuals each	No
			Populations naturally reproducing, stable and increasing in numbers	Partially
			Populations secure from threats	Partially
			Populations persisting for a minimum of 5 years	No
2014 (5-yr review)	~ 500	0	5-7 populations with minimum of 300 mature individuals each	No
			Populations naturally reproducing, stable and increasing in numbers	Partially
			Populations secure from threats	Partially
			Populations persisting for a minimum of 5 years	No

Table 2. Threats to *Remya mauiensis* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Ungulates – degradation of habitat and herbivory	A, C, D, E	Ongoing	Partially, Manawainui is fenced
Invasive introduced plants	A, E	Ongoing	None
Invertebrate herbivory or predation	C	Ongoing	None
Fire	E	Ongoing	None
Climate change	A, E	Increasing	Partially, seed storage

References:

See previous 5-year review for a full list of references (USFWS 2009). Only references for new information are provided below.

Fortini, L., J. Price, J. Jacobi, A. Vorsino, J. Burgett, K. Brinck, F. Amidon, S. Miller, S. Gon II, G. Koob, and E. Paxton. 2013. A landscape-based assessment of climate

- change vulnerability for all native Hawaiian plants. Technical report HCSU-044. Hawaii Cooperative Studies Unit, University of Hawaii at Hilo, Hawaii. 141 pages.
- Harold L. Lyon Arboretum Seed Conservation Laboratory. 2013. Seed storage database. University of Hawaii at Manoa, Honolulu, Hawaii. Unpublished.
- Maui Nui Botanical Gardens. 2012. Report on controlled propagation of listed and candidate species, as designated under the U.S. Endangered Species Act. 15 pages. Unpublished.
- National Tropical Botanical Garden. 2013. Report on controlled propagation of listed and candidate species, as designated under the U.S. Endangered Species Act. 30 pages. Unpublished.
- [PEPP] Plant Extinction Prevention Program. 2011. Plant Extinction Prevention Program annual report, fiscal year 2011 (July 1, 2010-June 30, 2011). 200 pages. Unpublished.
- [USFWS] U.S. Fish and Wildlife Service. 1997. Recovery plan for the Maui plant cluster. U.S. Fish and Wildlife Service, Portland, Oregon. 130 pages + appendices.
- [USFWS] U.S. Fish and Wildlife Service. 2009. *Remya mauiensis* 5-year review summary and evaluation. Pacific Islands Fish and Wildlife Office, Honolulu, Hawaii. 14 pages.
- [USFWS] U.S. Fish and Wildlife Service. 2012. Endangered and threatened wildlife and plants; listing 38 species on Molokai, Lanai, and Maui as endangered and designating critical habitat on Molokai, Lanai, Maui, and Kahoolawe for 135 species; proposed rule. Federal Register 77(112):34464-34775.

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SIGNATURE PAGE for 5-YEAR REVIEW of *Remya mauiensis* (Maui remya)

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: _____

FO **Programmatic Deputy Field Supervisor, Pacific Islands Fish and Wildlife Office**

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Date 2014-06-05