

## 5-YEAR REVIEW

Short Form Summary

**Species Reviewed:** *Melicope adscendens* (Alani)

**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; initiation of 5-year status reviews of 46 species in Idaho, Washington, Hawaii, Guam, and the Commonwealth of 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):**

Diane Sether, Ph.D., Fish and Wildlife Biologist, PIFWO

Chelsie Javar-Salas, Plant 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 *Melicope adscendens* (USFWS 2008). The evaluation by Diane Sether, Ph.D., Fish and Wildlife Biologist, was reviewed by Chelsie Javar-Salas, Plant Biologist, the Island Team Manager and the 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](http://ecos.fws.gov/tess_public)).

### **Review Analysis:**

Please refer to the previous 5-year review for *Melicope adscendens* published on January 18, 2008 (available at [http://ecos.fws.gov/docs/five\\_year\\_review/doc1849.pdf](http://ecos.fws.gov/docs/five_year_review/doc1849.pdf)) for a complete review of the species' status, 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 *Melicope adscendens*.

This long-lived perennial is endangered and occurs only on the island of Maui (USFWS 1997). The current status and trends for *Melicope adscendens* are provided in the tables below.

New status information:

- One plant is present as of July 6, 2012, in an outplanting established at Puu Mahoe Arboretum (PEPP 2013).
- One plant is present on State owned land in Kanaio Natural Area Reserve, Maui (PEPP 2012).
- Approximately 20 plants are present on private land in Auwahi, Maui (PEPP 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 *Melicope adscendens* is highly vulnerable to the impacts of climate change. Therefore, additional management actions are needed to conserve this taxon into the future.

New management actions:

- Population viability monitoring and analysis – The Plant Extinction Prevention Program (2010, 2011, 2012, 2013, and 2014) monitors the populations on Maui.
- Invasive plant monitoring and control – The Plant Extinction Prevention Program (2010, 2011, 2012, 2013, and 2014) conducts weed removal, bags fruit, and collects seed from the *Melicope adscendens* populations on Maui.
- Listing and critical habitat designation – A single unit of occupied area and 3 units of unoccupied critical habitat for *Melicope adscendens* was proposed in the lowland dry ecosystem on Maui (USFWS 2012). An additional unit of occupied area of critical habitat was proposed in the montane mesic ecosystem on Maui (USFWS 2012). The final rule for critical habitat designations has not been published at the time of this review.
- Captive propagation for genetic storage and reintroduction
  - The Harold L. Lyon Arboretum's Seed Conservation Lab (2012) has 160 seeds in storage and 5 micropropagules.
  - The Olinda Rare Plant Nursery (2013) reported 1 potted *Melicope adscendens* plant.
  - The National Tropical Botanical Garden (2013) reported 7 *Melicope adscendens* seeds in storage from the Kanaio Natural Area Reserve.

**Synthesis:**

Stabilizing, downlisting, and delisting objectives are provided in the recovery plan for Maui plants (USFWS 1997), based on whether the species is an annual, a short-lived perennial (fewer than 10 years), or a long-lived perennial. *Melicope adscendens* is a long-lived perennial, and to be considered stable, 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 Maui. Each of these populations must be naturally reproducing and increasing in number, with a minimum of 25 mature individuals per population.

The interim stabilization goals for this species have not been met, as currently no population of 25 mature individuals exists (Table 1) and all threats are not being managed (Table 2). Therefore, *Melicope adscendens* 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
  - Evaluate genetic resources currently in storage to determine the need to place additional genetic resources in long-term storage due to this species high vulnerability to climate change.
  - Continue seed collection for complete *ex situ* genetic storage and reintroduction.
- Reintroduction / translocation
  - Augment populations as genetically appropriate individuals become available in nurseries and as habitat is protected.
  - Reintroduce individuals into suitable habitat within the current and historical range in areas where threats are managed.
- Surveys / inventories – Survey the geographical and historical range of *Melicope adscendens* to assess the status of known populations and possible additional populations.
- Ungulate monitoring and control – Fence remaining populations to protect them from the impacts of feral ungulates.
- Invasive plant species monitoring and control - Eradicate invasive introduced plants and rodents within the vicinity of *Melicope adscendens* populations and maintain *Melicope adscendens* habitat free of invasive introduced plants.
- 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. Trends of *Melicope adscendens* from listing through current 5-year review.**

<b>Date</b>	<b>No. wild indivs</b>	<b>No. outplanted</b>	<b>Stability Criteria identified in Recovery Plan</b>	<b>Stability Criteria Completed?</b>
1994 (listing)	1	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 25 mature individuals each	No
1996 (recovery plan)	16	0	All threats managed in all 3 populations	Partially
			Complete genetic storage	No
			3 populations with 25 mature individuals each	No
2003 (critical habitat)	16	0	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially
			3 populations with 25 mature individuals each	No
2007 (5-yr review)	26	0	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially
			3 populations with 25 mature individuals each	Partially, 1 population
2012 (critical habitat – proposed)	33	unknown	All threats managed in all 3 populations	Unknown
			Complete genetic storage	Partially
			3 populations with 25 mature individuals each	No
2014 (5-yr review)	21	1	All threats managed in all 3 populations	Partially (Table 2)
			Complete genetic storage	Partially
			3 populations with 25 mature individuals each	No

**Table 2. Threats to *Melicope adscendens* and ongoing conservation efforts.**

<b>Threat</b>	<b>Listing factor</b>	<b>Current Status</b>	<b>Conservation/ Management Efforts</b>
Ungulates – Degradation of habitat, herbivory, and trampling	A, C, E	Ongoing	Partially: Some populations/individuals are within fenced areas.
Invertebrate herbivory and predation	C	Ongoing	Partially; Fruit on plant at Kanaio is bagged to prevent herbivory
Alien invasive plant species	A, E	Ongoing	Partially; Periodic weed control at Kanaio
Climate change	A, E	Increasing	None
Rodent predation or herbivory	C	Ongoing	Partially; Periodic snap-trap use at Kanaio
Disturbances from ranch activities	E	Ongoing	None
Low Numbers	E	Ongoing	Partially; Genetic storage and outplanting are ongoing
Drought	A, E	Ongoing	None

**References:**

See previous 5-year review for a full list of references (USFWS 2008). 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 Micropropagation Laboratory. 2012. Micropropagation database. University of Hawaii at Manoa, Honolulu, Hawaii. 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.

Olinda Rare Plant Facility. 2013. Report on controlled propagation of listed and candidate species, as designated under the U.S. Endangered Species Act. 5 pages. Unpublished.

[PEPP] Plant Extinction Prevention Program. 2010. Plant Extinction Prevention Program annual report, fiscal year 2010 (July 1, 2009-June 30, 2010). 122 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.
- [PEPP] Plant Extinction Prevention Program. 2012. Annual report for Plant Extinction Prevention Program, Fiscal Year 2012 (July 1, 2011-June 30, 2012). 169 pages. Unpublished.
- [PEPP] Plant Extinction Prevention Program. 2013. Annual report for Plant Extinction Prevention Program, Fiscal Year 2013 (July 1, 2012-June 30, 2013). 207 pages. Unpublished.
- [PEPP] Plant Extinction Prevention Program. 2014. Progress report for Plant Extinction Prevention Program, Fiscal Year 2014, QTR 1-2 (July 1, 2013-December 31, 2013). 21 pages. Unpublished.
- [USFWS] U.S. Fish and Wildlife Service. 2008. Alani (*Melicope adscendens*) 5-year review. Pacific Islands Fish and Wildlife Office, Honolulu, Hawaii. 6 pages. Available online at [http://ecos.fws.gov/docs/five\\_year\\_review/doc1849.pdf](http://ecos.fws.gov/docs/five_year_review/doc1849.pdf).
- [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.

**U.S. FISH AND WILDLIFE SERVICE**  
**SIGNATURE PAGE for 5-YEAR REVIEW of *Melicope adscendens***  
**(Alani)**

**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

**Appropriate Listing/Reclassification Priority Number, if applicable:**           

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

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Date 2014-06-05