5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Scaevola coriacea* (dwarf naupaka)

Current Classification: Endangered

Federal Register Notice announcing initiation of this review:

[USFWS] U.S. Fish and Wildlife Service. 2019. Endangered and threatened wildlife and plants; initiation of 5-year status reviews for 91 species in Oregon, Washington, Hawaii, and American Samoa. Federal Register 84(112): 27152–27154, June 11, 2019.

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 2020. The review was based on a review of current, available information since the last 5-year review for *Scaevola coriacea* (USFWS 2014). 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 (*http://ecos.fws.gov/tess_public*).

Review Analysis:

Please refer to the previous 5-year reviews for *Scaevola coriacea* published in the Federal Register on August 27, 2010 and June 5, 2014 (available at *https://ecos.fws.gov/docs/tess/species_nonpublish/1626.pdf* and *https://ecos.fws.gov/docs/tess/species_nonpublish/2206.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 *S. coriacea*.

This short-lived, perennial herb in the *Goodeniaceae* (goodenia) family is endangered and endemic to Ni‘ihau, Kaua‘i, O‘ahu, Lāna‘i, Maui, Hawai‘i, and two offshore islets off Maui and Moloka‘i (USFWS 1997). It is currently only found on Maui and offshore islets off Maui and Moloka‘i. The status and trends for *Scaevola coriacea* are provided in the tables below.

New Status Information:

- The Plant Extinction Prevention Program (PEPP) conducts management and monitoring of *Scaevola coriacea* (PEPP 2020). Currently, there are 5 wild populations totaling 85 individuals, and 11 outplanted populations totaling 47 individuals. The 2 largest wild populations are both located on Maui, and account for 72 of the wild individuals (PEPP 2020). PEPP (2018) also reported 7 wild individuals of *S. coriacea* on ʻŌkala Islet and 2 wild individuals on Moku Hoʻoniki Islet, both islets off of Molokaʻi.

New Threats:

- Climate change loss or 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 Hawaiʻi 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 *Scaevola coriacea* is highly vulnerable to the impacts of climate change, with a vulnerability score of 0.573 (on a scale of 0 being not vulnerable to 1 being extremely vulnerable to climate change). Therefore, additional management actions are needed to conserve this taxon into the future, such as locating key microsites that overlap with current and future climate envelopes for outplanting efforts.

New Management Actions:

- Surveys and inventories—PEPP monitors wild and outplanted populations, and collects fruits and cuttings from wild populations while monitoring *Scaevola coriacea* (PEPP 2020).
- Ungulate monitoring and control—A fencing exclosure protects a population of *S. coriacea* and additional populations are monitored for ungulate disturbance by PEPP staff (PEPP 2020).
- Invasive plant monitoring and control— PEPP conducts weed control around wild and outplanted populations (PEPP 2020).
- Captive propagation for genetic storage and reintroduction—
    - The Lyon Seed Conservation Laboratory reports 122 seeds in storage from 3 founder plants (Lyon Arboretum 2020).
    - Maui Nui Botanical Garden (MNGB) reports 97 seeds in storage, 9 individual plants in living collection, and 59 cuttings in propagation from 4 founder plants (MNBG 2020).
    - National Tropical Botanical Garden (NTBG) reports 79 seeds in storage and 272 plants in propagation representing 6 founder plants (NTBG 2020).
- Reintroduction— *Scaevola coriacea* outplantings have been completed at 16 sites, and currently 47 total individuals remain at 11 sites (PEPP 2020).

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

Date	No. wild individuals	No. outplanted	Stability Criteria identified in Recovery Plan	Stability Criteria Completed?
1986 (listing)	350	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
1997 (recovery plan)	<340	unknown	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2010 (5-year review)	108	160	All threats managed in all 3 populations	No
			Complete genetic storage	Yes
			3 populations with 50 mature individuals each	No
2014 (5-year review)	103	13	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?**
2021 (5-year review)	85	47	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially
			Natural reproduction at all 3 populations	No
			3 populations with 50 mature individuals each	Partially

* 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 *Scaevola coriacea* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Ungulate degradation of habitat	A	Ongoing	Partial, one population is fenced
Established ecosystem altering invasive plant species degradation of habitat	A	Ongoing	Partial, nonnative plant control
Drought destruction and degradation of habitat	A	Ongoing	None
Fire destruction or degradation of habitat	A	Ongoing	None
Development	A	Ongoing	None
Off-Road Vehicles	A	Ongoing	None
Impacts from collecting	B	Ongoing	None
Rodent predation or herbivory	C	Ongoing	None
Invertebrate predation or herbivory	C	Ongoing	None
Slug herbivory	C	Ongoing	None
Reduced viability due to low numbers	E	Ongoing	Partial, propagation and seed storage efforts are ongoing
Climate change degradation or loss of habitat, including hurricanes	E	Ongoing	None

Synthesis:
Currently there are 85 wild individuals, (83 mature and 2 immature) of *Scaevola coriacea* on Maui and offshore islets off Moloka‘i. A landscape-based assessment of climate change vulnerability for native plants of Hawai‘i using high resolution climate change projections was made by Fortini *et al.* (2013) and their analysis showed that *S. coriacea* is highly vulnerable to the effects of climate change. Some individuals are provided protection by fencing and nonnative plant control. Seed collections, propagation, and outplanting are ongoing.

Stabilizing (interim), downlisting, and delisting objectives were provided in the Recovery Plan for the Maui plant cluster (USFWS 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.

Scaevola coriacea 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 three populations should be documented on Maui and offshore islets off Maui and Moloka‘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. Although some individuals are in genetic storage (Table 1), there is possibly one population totaling at least 50 individuals, but the individuals are not reproducing, and all threats are not being managed (Table 1, Table 2). Therefore, *Scaevola coriacea* meets the definition of Endangered as it remains in danger of extinction throughout its range.

Recommendations for Future Actions:
We are not aware of any new threats or significant new information regarding the species' biological status since the last 5-year review in 2014. Thus, the following recommendations for future actions are reiterated for the 5-year review for 2020.

- Surveys and inventories—
    - The historical range of *Scaevola coriacea* should be surveyed intensively, preferably on Maui which coincides with the greatest number of historical records of flowering time.
    - 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 plant monitoring and control—Continue control of established ecosystem-altering nonnative invasive plant species, and those that compete with *S. coriacea* .
- Site and habitat protection—Develop and implement effective control measures to reduce the impacts of development, over-collection, and drought.

- Fire monitoring and control—Continue to develop and implement fire prevention management plans.
- Climate change adaptation strategy—Assess the modeled effects of climate change on this species and use to determine future landscape needed for the recovery of the species.
- Predator and herbivore monitoring and control—Determine and implement effective methods to control rodents and insect pests.
- Captive propagation for genetic storage and reintroduction—Continue collection and propagation efforts for maintenance of genetic stock and for reintroduction.
- Reintroduction and translocation—Continue to reintroduce individuals into suitable habitat within historic range that is being managed for known threats to this species to build resiliency and redundancy to reduce impacts of small population sizes.
- 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 between populations) 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:

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. 134 pp.

[HBMP] Hawaii Biodiversity and Mapping Program. 2010. Plant species GIS data and Access species database.

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

Lyon Arboretum. 2020. 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, Hawaii.

[MNBG] Maui Nui Botanical Garden. 2020. 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. 2020. 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.

[PEPP] Plant Extinction Prevention Program. 2020. Report on field monitoring 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.

[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.

[USFWS] 2010. *Scaevola coriacea* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. *https://ecos.fws.gov/docs/tess/species_nonpublish/1626.pdf.*

[USFWS] 2014. *Scaevola coriacea* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. and *https://ecos.fws.gov/docs/tess/species_nonpublish/2206.pdf.*

[USFWS] 2019. Endangered and threatened wildlife and plants; initiation of 5-year status reviews for 91 species in Oregon, Washington, Hawaii, and American Samoa. Federal Register 84(112): 27152–27154, June 11, 2019.

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SIGNATURE PAGE for 5-YEAR REVIEW of *Scaevola coriacea* (dwarf naupaka)

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**

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