

5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Sanicula purpurea* (no common name)

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:

Daniel Adamski, 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 *Sanicula purpurea* (USFWS 2018). The evaluation by Daniel Adamski, 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/4708>).

Review Analysis:

Please refer to the previous 5-year reviews for *Sanicula purpurea* published in the Federal Register on August 2, 2011, (available at https://ecos.fws.gov/docs/tess/species_nonpublish/1734.pdf) and October 23, 2018, (available at https://ecos.fws.gov/docs/tess/species_nonpublish/2657.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. purpurea*.

This short-lived perennial herb in the Apiaceae (parsley) family is endangered and is known from island of Maui and the Ko‘olau Mountains of the island of O‘ahu. The status and trends for *Sanicula purpurea* are provided in the tables below.

New Status Information:

- Currently, there is one known population on Maui at Honokōhau totaling three mature and one immature individual (Plant Extinction Prevention Program (PEPP) 2022). Two additional populations known from Maui, at Honokōhau and Honokōwai, were monitored in 2020 and no individual plants were observed (PEPP 2020, 2022). On O‘ahu, three populations are known from Helemano, Kaukonahua, and Schofield-Waikāne totaling 21 mature plants (Ching-Harbin et al. 2020; 2021; Ching-Harbin and Thomas 2021). Approximately four additional populations from O‘ahu and Maui have not been monitored in over 15 years, and the status of the plants is unknown. The International Union for the Conservation of Nature (IUCN) assessment of *Sanicula purpurea* from 2016 estimated as many at 60 individuals in eight subpopulations for both islands (Keir et al. 2016).
- Currently, there are approximately 11 founder lines represented in *ex situ* storage and propagation collections, including seeds in seed banks and plants in a nursery or living collection.

New Threats:

- None

New Management Actions:

- Monitoring and surveys—PEPP monitors individuals of *Sanicula purpurea* on Maui and the Ko‘olau Mountains of the island of O‘ahu (PEPP 2020; 2022; Ching-Harbin et al. 2020; 2021; Ching-Harbin and Thomas 2021).
- Ungulate monitoring and management—PEPP monitored and maintained fencing on Maui at Honokōhau (PEPP 2022).
- Invasive nonnative plant management—PEPP controls nonnative plants around wild populations of *Sanicula purpurea* on Maui and the Ko‘olau Mountains of the island of O‘ahu (PEPP 2020; 2022; Ching-Harbin et al. 2020; 2021; Ching-Harbin and Thomas 2021).
- Collection and propagation for genetic storage and reintroduction—
 - From 2018-2021, PEPP made 16 individual collections from plants at Helemano on O‘ahu (Ching-Harbin et al. 2020; 2021; Ching-Harbin and Thomas 2021; Togikawa 2018).
 - Army Natural Resource Program (ANRP) reports 134 seeds in storage representing five founders from Helemano on O‘ahu (ANRP 2022).
 - Lyon Arboretum Seed Conservation Laboratory reports 315 seeds in storage representing one founder each from Honokōhau and Honokōwai on Maui, and nine founders from Helemano on O‘ahu (Lyon Arboretum 2022).
 - O‘ahu Rare Plant Nursery (ORPN) reports three individual plants in cultivation representing one founder from Helemano on O‘ahu (ORPN 2022).

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

Date	No. wild individuals	No. outplanted	Stability Criteria identified in Recovery Plan	Stability Criteria Completed?
1996 (listing)	130–210	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2011 (5-year review)	80 (O‘ahu) ca 50 (Maui)	4	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)	ca 16 (O‘ahu) > 10 (Maui)	0	All threats managed in all 3 populations	Partially
			Reproduction (i.e., viable seeds, seedlings, saplings) at all X populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2023 (5-year review)	21 (O‘ahu) > 4 (Maui)	0	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	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 *Sanicula purpurea* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Degradation and destruction of habitat by feral ungulates	A	Ongoing	Partial, one population fenced
Established ecosystem altering invasive plant species degradation of habitat	A	Ongoing	Partial, some nonnative plant control at monitored populations
Climate change degradation or loss of habitat, including hurricanes	A	Ongoing	None
Predation and herbivory by feral ungulates	C	Ongoing	Partial, one population fenced
Predation and herbivory by rats	C	Ongoing	None
Predation and herbivory by invertebrates—Slugs, snails, black twig borer	C	Ongoing	None
Reduced viability due to low numbers	E	Ongoing	Partial, propagation and seed storage efforts are ongoing

Synthesis:

Currently there are four wild individuals of *Sanicula purpurea* on Maui, three mature and one immature plant, and 21 mature individuals on O‘ahu. Some individuals are provided protection by fencing and nonnative plant control. Seed collections and propagation are ongoing.

Stabilizing (interim), downlisting, and delisting objectives are provided in the Recovery Plan for the Multi-Island Plants (USFWS 1999), 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.

Sanicula purpurea is a short-lived perennial herb in the Apiaceae (parsley) family. 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 and O‘ahu where they now occur or occurred historically and each of these populations must be naturally reproducing (i.e., viable seeds and seedlings) with a minimum of 50 mature, reproducing individuals per population.

The preventing extinction goals for this species have not been met. Genetic storage collections are ongoing (Table 1), there are no populations totaling at least 50 reproducing individuals, and all threats are not being managed (Table 1, Table 2). Therefore, *Sanicula purpurea* 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 reiterated for the 5-year review for 2023.

- Surveys and inventories—
 - The historical range of *Sanicula purpurea* should be surveyed, including populations at Paunau and ‘Eke on Maui, and populations on Oahu.
 - Continue surveys for populations of *S. purpurea* in areas of potentially suitable habitat on Maui and O‘ahu.
 - Determine suitable locations for reintroductions.
- Ungulate monitoring and control—Continue to maintain fenced exclosures and construct new fences 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 *Sanicula purpurea* within and around all wild populations.
- Fire prevention and control—Develop and implement fire prevention management plans and monitor populations after fire occurrence.
- Climate change adaptation strategy—Research suitability of habitat for viability of species, including where to conduct translocations in the future due to the impacts of climate change, including increasing temperatures, periods between

- rain events, and frequency and intensity of hurricanes. Additional management actions may be needed, such as locating microsites that overlap with current and future climate envelopes for translocation efforts.
- Predator and herbivore monitoring and control—Determine and implement effective methods for control of rodents and slugs around wild populations.
 - Captive propagation for genetic storage and reintroduction—Continue collection and propagation efforts for maintenance of genetic stock and initiate plans for reintroductions.
 - Build resiliency, redundancy, and representation — Increase species' viability through habitat restoration, threat control, and reintroduction and translocation. Continue reintroduction into suitable habitat that is being managed for known threats to this species to reduce impacts of erosion, treefall, flooding, and hurricanes.
 - 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:

- [ANRP] Army Natural Resource Program. 2022. Appendices to the Status report for the Mākua and O‘ahu Implementation Plans, Army Natural Resources Program, O‘ahu, Office of the Vice President for Research and Innovation, University of Hawai‘i.
- Ching-Harbin, S., and M. Thomas. 2021. Hawai‘i Rare Plant Restoration Group (HRPRG) Field Data Form in PEPP 2022: Plant Extinction Prevention Program, FY 2022 Annual Report (Oct 1, 2021-Sep 30, 2022), USFWS CFDA Program #15.657, Endangered Species Conservation-Recovery Implementation Funds, Coop Agreement F19AC00532 (Interim Report), December 29, 2022, UH Mānoa, PCSU, PEPP. 134 pp. BioPacifica database record for *Sanicula purpurea*, Pacific Islands Fish and Wildlife Office.
- Ching-Harbin, S., T. Togikawa, and J. Serrano. 2020. Hawai‘i Rare Plant Restoration Group (HRPRG) Field Data Form in PEPP 2022: Plant Extinction Prevention Program, FY 2022 Annual Report (Oct 1, 2021-Sep 30, 2022), USFWS CFDA Program #15.657, Endangered Species Conservation-Recovery Implementation Funds, Coop Agreement F19AC00532 (Interim Report), December 29, 2022, UH Mānoa, PCSU, PEPP. 134 pp. BioPacifica database record for *Sanicula purpurea*, Pacific Islands Fish and Wildlife Office.
- Ching-Harbin, S., T. Togikawa, and J. Serrano. 2021. Hawai‘i Rare Plant Restoration Group (HRPRG) Field Data Form in PEPP 2022: Plant Extinction Prevention Program, FY 2022 Annual Report (Oct 1, 2021-Sep 30, 2022), USFWS CFDA Program #15.657, Endangered Species Conservation-Recovery Implementation Funds, Coop Agreement F19AC00532 (Interim Report), December 29, 2022, UH

- Mānoa, PCSU, PEPP. 134 pp. BioPacifica database record for *Sanicula purpurea*, Pacific Islands Fish and Wildlife Office.
- [HPPRCC] Hawai‘i and Pacific Plants Recovery Coordinating Committee. 2011. Revised recovery objective guidelines. 8 pp.
- Keir, M., S.M. Gon, N. Sugii, J. Kwon, M. Chau, M. Bruegmann, V.L. Caraway, and L. Weisenberger. 2016. *Sanicula purpurea*. The IUCN Red List of Threatened Species 2016:e.T80212525A115505660.
<http://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T80212525A80212529.en>.
- 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.
- [ORPN] O‘ahu Rare Plant Nursery. 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.
- [PEPP] 2020. Plant Extinction Prevention Program final report (October 1, 2018-September 30, 2019), U.S. Fish and Wildlife Service Coast Program, Catalog of Federal Domestic Assistance (CFDA) # 15.630, Award #F17AC00452, Pacific Cooperative Studies Unit, University of Hawaii, Honolulu. 26 pp.
- [PEPP] 2022. Plant Extinction Prevention Program fiscal year 2022 interim performance report (October 1, 2021-September 30, 2022), Cooperative Agreement F19AC00532 (Interim report), U.S. Fish and Wildlife Service CFDA Program #15.657 Endangered Species Conservation—Recovery Implementation Funds, University of Hawai‘i at Mānoa, Pacific Cooperative Studies Unit, Plant Extinction Prevention Program. 50 pp.
- Togikawa, K. 2018. Hawai‘i Rare Plant Restoration Group (HRPRG) Field Data Form in PEPP 2022: Plant Extinction Prevention Program, FY 2022 Annual Report (Oct 1, 2021-Sep 30, 2022), USFWS CFDA Program #15.657, Endangered Species Conservation-Recovery Implementation Funds, Coop Agreement F19AC00532 (Interim Report), December 29, 2022, UH Mānoa, PCSU, PEPP. 134 pp. BioPacifica database record for *Sanicula purpurea*, Pacific Islands Fish and Wildlife Office.
- [USFWS] U.S. Fish and Wildlife Service. 1999. Recovery plan for multi-island plants. U.S. Fish and Wildlife Service, Portland, Oregon. 206 pages + appendices.

[USFWS] 2011. *Sanicula purpurea* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI.
https://ecos.fws.gov/docs/tess/species_nonpublish/1734.pdf.

[USFWS] 2018. *Sanicula purpurea* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI.
https://ecos.fws.gov/docs/tess/species_nonpublish/2657.pdf.

[USFWS] 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.

U.S. FISH AND WILDLIFE SERVICE

SIGNATURE PAGE for 5-YEAR REVIEW of *Sanicula purpurea* (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
- No Change in listing status

For Field Supervisor, Pacific Islands Fish and Wildlife Office

Date _____