5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Sicyos albus* (ʻānunu)

Current Classification: Endangered

Federal Register Notice announcing initiation of this review:

[USFWS] U.S. Fish and Wildlife Service. 2023. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status reviews for 133 Species in Oregon, Washington, Idaho, Montana, California, Hawaii, Guam, and the Northern Mariana Islands . Federal Register 88(56): 17611–17614, March 23, 2023.

Lead Region/Field Office:

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

Name of Reviewer:

Daniel Adamski, Biologist, PIFWO
Lauren Weisenberger, Plant Recovery Coordinator, PIFWO
Megan Laut, Recovery Program 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 2023. The review was based on a review of current, available information since the last 5-year review for *Sicyos albus* (USFWS 2020). The evaluation by Daniel Adamski, Biologist, was reviewed by Lauren Weisenberger, Plant Recovery Coordinator, and Megan Laut, Recovery Program 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/4226*).

Review Analysis:

Please refer to the previous 5-year reviews for *Sicyos albus* published in the Federal Register on August 28, 2012 (available at *https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/1962.pdf*), and on September 30, 2020 (available at *https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/3187.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 *Sicyos albus*.

This short-lived annual vine in the Cucurbitaceae (gourd) family is endangered and found on the island of Hawaiʻi. The status and trends for *Sicyos albus* are provided in the tables below.

New Status Information:

- Currently, there are two wild individuals of *Sicyos albus* in one location at Hawai‘i Volcanoes National Park [HVNP] (HVNP 2024).
- Currently, there are two founder lines represented in *ex situ* storage and propagation collections, including seeds in seed banks and plants in a nursery or living collection (HVNP 2024; Lyon Arboretum 2024).

New Threats:

- None

New Management Actions:

- Monitoring and surveys—Staff from the National Park Service monitor wild plants in a fenced exclosure at HVNP (HVNP 2024).
- Collection and propagation for genetic storage and reintroduction—
    - HVNP staff reported collecting 300 seeds from two founders between 2022 and 2024 (HVNP 2024).
    - Lyon Arboretum Seed Conservation Laboratory reports nine seeds in storage from one founder plant (Lyon Arboretum 2024).

Table 1. Status and trends of *Sicyos albus* from listing through current 5-year review. Table 1a shows progress according to Interim Stabilization Goals; Table 1b shows progress according to Preventing Extinction Goals.

Table 1a.

Date	No. wild individuals	No. Outplanted	Stability Goals identified in Recovery Plan	Stability Goals Completed?
1996 (Listing)	21	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 100 mature individuals each	No
2012 (5-year review)	5	16	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially
			3 populations with 100 mature individuals each	Partially

Table 1b.

Date	No. wild individuals	No. outplanted	*Preventing Extinction Targets identified by HPPRCC	*Preventing Extinction Targets Completed?
2020 (5-year review)	2 mature	0	All threats managed in all 3 populations	Partially
			Reproduction (i.e., viable seeds, seedlings, saplings) at all 3 populations	Partially
			Complete genetic storage	No
			3 populations with 50 mature individuals each	Partially
2025 (5-year review)	2 mature	0	All threats managed in all 3 populations	Partially
			Complete genetic storage	Currently complete
			Reproduction (i.e., viable seeds, seedlings, saplings) at all 3 populations	Partially
			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 *Sicyos albus* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Ungulate destruction and degradation of habitat and herbivory	A, C	Ongoing	Partial, enclosure constructed at HVNP
Established ecosystem altering invasive plant species degradation of habitat	A, E	Ongoing	Partial, some nonnative plant control at HVNP
Lava flow and volcanic destruction and degradation of habitat	A	Ongoing	Partial, collections
Climate change degradation and destruction of habitat	A	Ongoing	None
Lack of adequate hunting regulations	D	Ongoing	Partial, exclosure at HVNP
Hiking and trail maintenance	E	Ongoing	Partial, exclosure at HVNP
Low numbers	E	Ongoing	Partial, collection and propagation

Synthesis:
Currently there are two wild individuals of *Sicyos albus* on the island of Hawai‘i. Individuals are provided protection from ungulates by fencing, and nonnative plant control. Seed collections, seed storage, and propagation are ongoing.

Stabilizing (interim) targets, and downlisting and delisting criteria are provided in the Addendum to the Recovery Plan for the Big Island Plant Cluster (USFWS 1998), and 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.

Sicyos albus is a short-lived annual vine. 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 the island of Hawai‘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 (Table 1). There are only two known wild individuals, and not all threats are being managed (Table 2). Therefore, *Sicyos albus* 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 2020. Thus, the following recommendations for future actions are updated or reiterated for the 5-year review for 2025.

- Surveys and monitoring—
  - Continue to monitor known populations of *Sicyos albus* to assess resiliency and make collections.
  - Continue surveys for populations of *Sicyos albus* in areas of potentially suitable habitat.
  - Determine suitable locations for reintroductions.
- Ungulate monitoring and control—Construct fenced exclosures and construct new fences to protect individuals from the negative impacts of browsing by ungulates.
- Invasive nonnative plant monitoring and control—Control established ecosystem-altering nonnative invasive plant species, and those that compete with *Sicyos albus*.
- Site and habitat protection—Develop and implement effective control measures to reduce the impacts of destruction by lava flows, hunting, and hiking.
- 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.
- Captive propagation for genetic storage and reintroduction—Continue to maintain collection and propagation efforts for maintenance of genetic stock and for reintroduction.
- Build resiliency, redundancy, and representation—Increase species' viability through habitat restoration, threat control, and reintroduction and translocation into suitable habitat that is being managed for known threats to this species to reduce impacts of reduced viability due to low numbers.
- 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:

[HAVO] Hawai‘i Volcanoes National Park. 2024. Annual report to the U.S. Fish and Wildlife Service threatened and endangered plants Hawaii Volcanoes National Park ES019078. 39 pp.

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

Lyon Arboretum. 2024. 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.

[USFWS] U.S. Fish and Wildlife Service. 1998. Recovery plan for the Big Island plant cluster, 1998. Portland. 80 pp. + appendices.

[USFWS] 2012. *Sicyos albus* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. *https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/1962.pdf*.

[USFWS] 2020. *Sicyos albus* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. *https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/3187.pdf*.

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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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