5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Gouania vitifolia* (no common name)

Current Classification: Endangered

Federal Register Notice announcing initiation of this review:

[USFWS] U.S. Fish and Wildlife Service. 2022. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status reviews for 167 Species in Oregon, Washington, Idaho, Montana, California, Hawaii, Guam, and the Northern Mariana Islands. Federal Register 87(90):28031–28034, May 10, 2022.

Lead Region/Field Office:

Region 1/Pacific Islands Fish and Wildlife Office (PIFWO), Honolulu, Hawai‘i

Name of Reviewer:

Cheryl Phillipson, 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 *Gouania vitifolia* (USFWS 2020). The evaluation by Cheryl Phillipson, 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/6347*).

Review Analysis:

Please refer to the previous 5-year reviews for *Gouania vitifolia* published in the Federal Register on August 2, 2007, August 28, 2012, and September 29, 2020 (available at *https://ecos.fws.gov/docs/tess/species_nonpublish/1101.pdf, https://ecos.fws.gov/docs/tess/species_nonpublish/2110.pdf, and https://ecos.fws.gov/docs/tess/sepcies_nonpublish/3148.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 *G. vitifolia*.

This short-lived perennial vine in the Rhamnaceae (buckthorn) family is endangered and is known from the islands of O‘ahu and Hawai‘i and historically from Maui. The status and trends for *Gouania vitifolia* are provided in the tables below.

New Status Information:

- In 2022, on Oʻahu, there are four mature and three immature wild individuals in one population (Keaʻau) (Army Natural Resources Program of Oʻahu [ANRPO] 2022 appendix 4-5, p. 597; ANRPO 2023a appendices, p. 307). On the island of Hawaiʻi, there are approximately 20 wild individuals in one population (Manukā) including seven recently discovered individuals (ANRPO 2023a, appendices p. 307; Plant Extinction Prevention Program [PEPP] 2021, p. 19, PEPP 2019–2023; State of Hawaiʻi 2023, p. 17). There are reintroduced plants at six sites on Oʻahu at Keaʻau, Pahole, and Waiʻanae Kai, totaling 77 mature and 47 immature individuals and 45 individuals in one *ex situ* site at Schofield Barracks West Range for seed production (ANRPO 2022, p. 97; ANRPO 2023a appendices, pp. 307). There are three individuals augmenting the wild population at Manukā (State of Hawaiʻi 2023, p. 17).
- Fifty-five founders from one wild populations (Keaʻau) on Oʻahu are represented in seed collections, micropropagation, nursery plants, and living and *ex situ* collections (ANRPO 2020 appendices, p. 445; ANRPO 2023a, appendices, p. 390).

New Threats:

- None reported.

New Management Actions:

- Surveys and monitoring—The State and PEPP discovered a new population at Manukā on the island of Hawaiʻi when surveying the area for fence installation for a known population (State of Hawaiʻi 2023, p. 17).
- Feral ungulate monitoring and control—The population on the island of Hawaiʻi is protected with a new fence (State of Hawaiʻi 2023, p. 17). A subpopulation at Keaʻau is fenced and ungulates are controlled at Waiʻanae Kai (ANRPO 2020, p. 50, appendices p. 406; ANRPO 2021 appendices, p. 389; ANRPO 2022 appendices, p. 503; ANRPO 2023 appendices, p. 351).
- Nonnative invasive plant monitoring and control—ANRPO conducts nonnative plant control at the reintroduced subpopulations at Keaʻau (ANRPO 2020, p. 50; ANRPO 2021, p. 47; ANRPO 2022, p. 55). ANRPO also outplants common native plant species (434 individuals in 2021) to improve habitat and reduce fuels for wildfires (ANRPO 2020, p. 50; ANRPO 2021, p. 82).
- Predation and herbivory—In 2019, PEPP set up a small grid of rodent traps at a seed scattering trial site (distributed by the Division of Forestry and Wildlife after the 2018 fire) to promote recruitment (PEPP 2019, pp. 62, 64).
- Collection and propagation for genetic storage and reintroduction—
    - In 2022, more than 50 viable seeds from 47 founders at Keaʻau were collected (ANRPO 2022, p. 97). Large bulk collections were made for use in determining protocols for storage and longevity research (ANRPO 2022, p. 97). In 2023, ANRPO collected and stored more than 20,000 seeds representing 56 founders at Keaʻau (ANRPO 2023b). ANRPO also propagated and stored 59 individuals representing six founders at Keaʻau and one founder at Kahua (ANRPO 2023b).

    - PEPP plans to establish a living collection for future seed collections for propagation and storage (State of Hawai‘i 2023, p. 17).
    - From 2005 through 2018, the Lyon Arboretum Seed Conservation Laboratory received 1,615 seeds representing 16 founders from Kea‘au (Lyon Arboretum 2022).
    - In 2005, the National Tropical Botanical Garden (NTBG) reported storage of 100 seeds collected from Kea‘au (NTBG 2022).
    - In 2019, the Pahole Rare Plant Facility reported propagation of two individuals representing two founders from an unspecified source on O‘ahu (Pahole Rare Plant Facility 2019).
    - In 2022, six plants were propagated representing two founders at Kea‘au (Waimea Arboretum 2022).
- Reintroduction and augmentation—
    - Three reintroduction sites have been established on O‘ahu: two subpopulations at Kea‘au (more than 100 with 1 mature and 47 immature remaining at the first and 18 individuals at the second), Pahole (10 individuals), and Wai‘anae Kai (57 individuals with 48 remaining) (ANRPO 2022, p. 97). On the island of Hawai‘i, three individuals augmented the population at Manukā in 2019 (PEPP 2019–2023).
    - PEPP outplanted 60 individuals at a subpopulation at Kea‘au in 2020 (PEPP 2020).
- Seed viability—ANRPO conducts seed viability testing and has changed the recollection interval for *Gouania vitifolia* from 10 years to every 15 years, with storage temperature at -18ºC (ANRPO 2021 appendices, p. 513; ANRPO 2022, p. 97).

Table 1. Status and trends of *Gouania vitifolia* 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	Stabilization Criteria identified in Recovery Plan	Stabilization Criteria Completed?
1994 (listing)	>10 (O‘ahu)	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2007 (5-year review)	58–64 (O‘ahu)	0	All threats managed in all 3 populations	Partial, fire management plan for

	ca 20 (Hawai‘i)			O‘ahu; nonnative plant management
			Complete genetic storage	Partial, complete for 1 population
			3 populations with 50 mature individuals each	Partial, 1 population >50
2012 (5-year review)	62 (O‘ahu) 12 (Hawai‘i)	1 (Hawai‘i)	All threats managed in all 3 populations	Partial
			Complete genetic storage	Partial
			3 populations with 50 mature individuals each	Partial

Table 1b.

Date	**No. wild individuals**	**No. outplanted**	***Preventing Extinction Targets identified by HPPRCC**	***Preventing Extinction Targets Completed?**
2020 (5-year review)	ca 2 (O‘ahu) 13 (Hawai‘i)	ca 100 (O‘ahu)	All threats managed in all 3 populations	Partial, fencing
			Complete genetic storage	Partial
			Reproduction (i.e., viable seeds, seedlings) at all 3 populations	Partial, reproduction at 1 population
			3 populations with 100 mature individuals each	No

2024 (5-year review)	4 mature, 3 immature (O‘ahu) ca 20 (Hawai‘i)	>100 outplanted on O‘ahu, currently 57 mature 38 immature survive; 3 (Hawai‘i)	All threats managed in all 3 populations	Partial, 2 subpopulations fenced, ungulate control at Wai‘anae Kai, nonnative plant control fenced areas
			Complete genetic storage	Partial, 55 O‘ahu founders represented
			Natural reproduction at all 3 populations	None reported
			3 populations with 100 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 *Gouania vitifolia* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Degradation and destruction of habitat by feral ungulates	A	Ongoing	Partial, 2 subpopulations fenced
Established ecosystem altering invasive plant species degradation of habitat and competition	A, E	Ongoing	Partial, management at 2 areas
Fire destruction and degradation of habitat	A	Ongoing	Partial, fire management plan for Army training area
Climate change degradation or loss of habitat	A	Ongoing	None
Small populations and reduced viability	E	Ongoing	Partial, seed storage, propagation, and translocation efforts

Synthesis:
Currently, one O‘ahu population totals four mature and three immature wild individuals. One population on the island of Hawaii totals approximately 20 wild individuals. Two subpopulations on O‘ahu are within a fenced area. There is some nonnative invasive plant

control in the two fenced areas. Fifty-five founders from the one wild population on O‘ahu are represented in *ex situ* collections.

Stabilizing (interim), and downlisting and delisting criteria are provided in the Recovery Plan for the O‘ahu Plants (USFWS 1998) and preventing extinction targets have been added and criteria 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.

Gouania vitifolia is a short-lived perennial vine and an obligate outcrosser. 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 O‘ahu and 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 100 mature, reproducing individuals per population.

The preventing extinction goals for *Gouania vitifolia* have not been met. The number of wild individuals continues to decline. No populations total at least 100 mature individuals, and no recruitment is reported (Table 1). Genetic storage collections are still being attempted for the Hawai‘i island population. Only two subpopulations are in a fenced area and have management of nonnative invasive plants (Table 2). Therefore, *G. vitifolia* 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 2024.

- Surveys and monitoring—Continue to monitor known populations and conduct surveys in suitable and historical habitat for additional populations.
- Ungulate monitoring and control—Continue to construct and maintain exclosures to provide protection from the negative impacts of habitat degradation by feral ungulates.
- Nonnative invasive plant monitoring and control—Continue to control established ecosystem-altering nonnative invasive plant species, and those that compete with *G. vitifolia*, at all populations.

- Fire monitoring and control—
  - Continue to implement fire management plans for all populations.
  - Establish populations in areas where damage or destruction by wildfire is less likely.
- Climate change adaptation strategy—Assess the modeled effects of climate change on this species and use to determine future landscape needed for its recovery.
- Captive propagation for genetic storage and reintroduction—Continue collection and propagation efforts for maintenance of genetic stock and for reintroduction.
- Reintroduction and augmentation—Continue to establish new populations and augment existing populations of *G. vitifolia* in suitable habitat within historical range that is being managed for known threats to this species.
- Build resiliency, redundancy, and representation—Increase species' viability through habitat restoration, threat control, and reintroduction and translocation to reduce impacts of climate change and loss of viability.
- Population biology research—
  - Continue to develop cryopreservation protocols.
  - Determine the number of genetically distinct individuals and the distribution of clones. Set goals for genetic representation in *ex situ* collections.
- Alliance and partnership development—Continue to work with ANRPO, DOFAW, PEPP, and other land managers and partners to initiate planning and contribute to implementation of ecosystem-level restoration and management to benefit this species.

References:

[ANRPO] Army Natural Resources Program of Oʻahu. 2020. 2020 Status report for the Mākua and Oʻahu Implementation Plans. Office of the Vice President for Innovation and Research, University of Hawaiʻi. 214 pp. + appendices, 516 pp.

[ANRPO] 2021. 2021 Status report for the Mākua and Oʻahu Implementation Plans. Office of the Vice President for Innovation and Research, University of Hawaiʻi. 207 pp. + appendices, 623 pp.

[ANRPO] 2022. 2022 Status report for the Mākua and Oʻahu Implementation Plans. Office of the Vice President for Innovation and Research, University of Hawaiʻi. 228 pp. + appendices, 690 pp.

[ANRPO] 2023a. 2023 Status report for the Mākua and Oʻahu Implementation Plans. Prepared by Army Natural Resources Program, Oʻahu, Office of the Vice President for Innovation and Research, University of Hawaiʻi. 255 pp. + appendices, 534 pp.

[ANRPO] 2023b. 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, Hawaiʻi.

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

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.

[NTBG] National Tropical Botanical Garden. 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.

Pahole Rare Plant Facility. 2019. 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. 2019. Plant Extinction Prevention Program, fiscal year 2019 interim performance report (October 1, 2018-September 30, 2019) cooperative agreement F18AC00502 (interim report), F14AC00174 (final report), US Fish and Wildlife Service CFDA Program #15.657, Endangered species conservation—recovery implementation funds, University of Hawaii at Manoa, Pacific Cooperative Studies Unit, Plant Extinction Prevention Program. 53 pp.

[PEPP] 2020. Plant Extinction Prevention Program fiscal year 2020 interim performance report (October 1, 2019-September 30, 2020), Cooperative Agreement F18AC00502 (Interim report), 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. 70 pp.

[PEPP] 2019–2023. Plant Extinction Prevention Program fiscal years 2019 to 2023 interim performance report (October 1, 2018-September 30, 2023). U.S. Fish and Wildlife Service CFDA Program $15.657 Endangered Species Conservation—Recovery Implementation Funds, Cooperative Agreement: F18AC00502 (Final performance report), University of Hawai‘i at Mānoa, Pacific Cooperative Studies Unit. 105 pp.

State of Hawai‘i, Department of Land and Natural Resources, Division of Forestry and Wildlife. 2023. Island Highlights: Rare Plant Program. 21 pp.

[USFWS] U.S. Fish and Wildlife Service. 1998. Recovery Plan for the O‘ahu Plants. Portland. 207 pp. + appendices.

[USFWS] 2007. *Gouania vitifolia* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. *https://ecos.fws.gov/docs/five_year_review/doc/1101.pdf.*

[USFWS] 2012. *Gouania vitifolia* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. *https://ecos.fws.gov/docs/five_year_review/doc/2110.pdf.*

[USFWS] 2020. *Gouania vitifolia* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. *https://ecos.fws.gov/docs/five_year_review/doc/3148.pdf.*

[USFWS] 2022. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status reviews for 167 Species in Oregon, Washington, Idaho, Montana, California, Hawaii, Guam, and the Northern Mariana Islands. Federal Register 87(90): 28031–28034, May 10, 2022.

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U.S. FISH AND WILDLIFE SERVICE
SIGNATURE PAGE for 5-YEAR REVIEW of *Gouania vitifolia* (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
__X__ No Change in listing status

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

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