

5-YEAR REVIEW
Short Form Summary
Species Reviewed: *Hedyotis megalantha* (Pao de'do')

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:

Anthony J.G. Tornito, 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 *Hedyotis megalantha* (USFWS 2020). The evaluation by Anthony J.G. Tornito, 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/9755>).

Review Analysis:

Please refer to the previous 5-year review for *Hedyotis megalantha* published in the Federal Register on December 15, 2020 (available at https://ecos.fws.gov/docs/tess/species_nonpublish/3214.pdf) Paudedo (*Hedyotis megalantha*) 5-Year Review Summary and Review, 2020, 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 *H. megalantha*.

This long-lived woody herb perennial in the Rubiaceae, coffee family is endangered and is known from the island of Guam of the Mariana Islands. The status and trends for *Hedyotis megalantha* are provided in the tables below.

New Status Information:

- Currently, there are approximately 800 individuals reported on Guam with no population information.
- There has been an absence of consistent surveys that are focused on distribution and abundance of *Hedyotis megalantha*; however, there have been recent sightings along Cross Island Road inward towards the mountains of the Talo'fo'fo' Watershed, Nimitz Hill, Mount Lamlam (Demeulenaere, 2020), and the Santa Rita-Sumai area near Mount Alifan. (*iNaturalist.org*– https://www.inaturalist.org/observations?taxon_id=549372).

New Threats:

- No new threats

New Management Actions:

- No new management actions

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

Date	No. wild individuals	No. Outplanted	Preventing Extinction Targets identified in Recovery Plan	Preventing Extinction Targets Completed?
2015 (listing)	<1,000	0	All threats managed in three populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	Partial, census of population numbers and sizes is incomplete
2020 (5-year review)	~ 800	0	All threats managed in three populations	No
			Complete genetic storage	No
			3 populations with 50, mature	Partial, census of population numbers and

			reproducing individuals each	sizes is incomplete
2024 (5-year review)	~ 800	0	All threats managed in 3 populations	No
			Complete genetic storage	No -
			Natural reproduction at all 3 populations	Unknown
			3 populations with 50 mature individuals each	Unknown

Table 2. Threats to *Hedyotis megalantha* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Loss and degradation of habitat due to development	A	Ongoing	Partial, efforts to assure conservation of native savanna vegetation initiated.
Invasive animal destruction and degradation of habitat	A	Ongoing	Partial, local collaborations to develop and implement brown treesnake control measures to conserve native savanna vegetation on Guam.
Ecosystem altering invasive plant species degradation of habitat	A	Ongoing	Partial, research ongoing on how to restore savanna habitats.
Fire	A	Ongoing	Partial, interagency efforts to reduce wildfire threat to native diverse savanna vegetation occur on Guam. Guam Forestry personnel cut firebreaks and do public outreach and education to reduce wildfire ignitions (FSRD 2020).
Typhoons and climate change degradation of loss of habitat	A	Ongoing	None

Inadequate existing regulatory mechanisms	D	Ongoing	None
Land clearing	E	Ongoing	Partial, development of Guam Habitat Conservation Plan
Direct impact from off-road vehicles	E	Ongoing	Partial, legislation to limit some activities
Wildfire	E	Ongoing	Partial, development of community wildfire prevention plan (FSRD, 2022)

Synthesis:

Currently there is an estimated 800 wild individuals of *Hedyotis megalantha* on Guam, with individuals recently observed along Cross Island Road inward towards the mountains of the Talo’fo’fo’ Watershed, Nimitz Hill, Mount Lamlam, and the Sãnta Rita-Sumai area near Mount Alifan. The Guam Plant Extinction Prevention Program (GPEPP) has attempted to propagate *H. megalantha* in their nursery; however, they found that *H. megalantha* difficult to grow and that the seedlings grow slowly. None have been reintroduced.

Preventing extinction targets, and downlisting, and delisting criteria are provided in the 2023 Recovery Plan for 23 Species in the Mariana Islands 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 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.

Hedyotis megalantha 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 a total of three populations should be documented on Guam 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. There have not been sufficient surveys to determine if there are at least three populations with a minimum of 50, mature, reproducing individuals. There is no genetic storage or ongoing controlled propagation due to the difficulty of growing this species in a nursery setting. Therefore,

Hedyotis megalantha 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.

- Determine population status and current distribution—Determine the distribution and number of all individuals on each island. Identify priority sites for species conservation. Assess the status and threats to each population to inform prioritization of conservation effort.
- Conduct thorough surveys of the areas located on Cross Island Road inward towards the mountains of the Talo'fo'fo' Watershed, Nimitz Hill, Mount Lamlam, and the Santa Rita-Sumai area near Mount Alifan to obtain population estimates and document the different plant life stages.
- Conduct research to clarify life history information and threats to the populations and their habitat—Conduct research to determine the best way to control the brown treesnake, rodents, and invasive invertebrates. Assess development and land designation and zoning threats to conservation of habitat needed for recovery.
- Conduct outreach in regards to human recreational activities (off-roading) and the impacts to habitat and listed species. Have workshops with businesses whose primary form of profit is from off-roading activities.
- Ungulate monitoring and control—construct new or continue to maintain 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 *Hedyotis megalantha*.
- Site and habitat protection—Develop and implement effective control measures to reduce the impact of illegal collection or over-visitation.
- Fire prevention and control—Continue to develop and implement fire prevention management plans.
- Captive propagation for genetic storage and reintroduction—Continue to collect seeds and other propagative materials for storage and reintroduction.
- Reduce human disturbance from military activities mortality and reduced viability—increase population resiliency by mitigating threats from military activities
- Fire prevention and control—Implement more effective fuel load control.
- Develop regulations and policy essential to recover the species and their habitats—Encourage the development of legislation to ensure protection of the listed species under Commonwealth or Territorial law. Develop and support the implementation of biosecurity plans to prevent the influx of new pests and invasive species into the Territory and inter-island movement of pests and invasive species.

- 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:

- [GDOAG, FSRD] 2021. Guam Department of Agriculture, Forestry and Soil Resources Division. & Guam Bureau of Statistics and Plans. Guam Forest Action Plan 2020 – 2030. Mangilao, Guam.
- [GDOAG, FSRD] 2022. Guam Department of Agriculture, Forestry and Soil Resources Division. & Guam Bureau of Statistics and Plans. Guam Forest System Plan. Mangilao, Guam.
- [USFWS] 2015. Endangered and threatened wildlife and plants; Endangered Status for 16 Species and Threatened Status for 7 Species in Micronesia. Federal Register, 80(190), 260-261.
- [USFWS] 2020. *Hedyotis megalantha* 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/3214.pdf
- [USFWS] 2023. Species report for *Hedyotis megalantha*. Pacific Islands Fish and Wildlife Office, Pacific Islands Interior Region 12, Portland OR. 37 pp.
- [USFWS] 2023. Recovery Plan for 23 Species in the Mariana Islands. Portland, Oregon. xiv+102 pp.

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SIGNATURE PAGE for 5-YEAR REVIEW of *Hedyotis megalantha*, Pao do'do'

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

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