5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Tabernaemontana rotensis* (no common name)

Current Classification: Threatened

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:

Bronson Curry, 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 January 2024. The review was based on a review of current, available information since the last 5-year review for *Tabernaemontana rotensis* (USFWS 2020, entire). The evaluation by Bronson Curry, Fish and Wildlife 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 (*https://ecos.fws.gov/ecp/species/Q3H0*).

Review Analysis:

Please refer to the previous 5-year review for *Tabernaemontana rotensis* published in the Federal Register on August 19, 2020 (available at *https://ecos.fws.gov/docs/tess/species_nonpublish/3043.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 *Tabernaemontana rotensis*.

Tabernaemontana rotensis is a medium-sized (26 to 33 feet (ft); 8 to 10 meters (m) tall), long-lived perennial tree in the Apocynaceae (dogbane) family endemic to the islands of Guam and Rota (Stone 1970, p. 485). Its leaves are thin, light green, opposite (a pair of leafs at each node, opposite each other), elliptic to oblong in shape, 6 to 12 inches (in) (15 to 30 centimeters (cm)) long, 2 to 4 in (5 to 10 cm) wide and contain a copious milky sap.

Its flowers are white, elongate, slender, and branch from the tree (Stone 1970, p. 485; UOG 2007, p. 6; GPEPP 2015, Appendix 2). The most recent status and trends for *Tabernaemontana rotensis* are provided in the tables below.

New Status Information:

- The most current population estimate is 15 known populations on two islands (Guam and Rota) totaling at least 16,000 naturally occurring individuals at varying growth stages (USFWS 2023, p. 3).
- Seven of the ten population units that occur on Guam have low resiliency due to the low number of individual plants, and all five population units that occur on Rota have very low resiliency. Three populations, all located within northern Guam, are inhabited by 100 or more individuals at varying stages of maturity (USFWS 2023, p. 19).

New Threats:

- No new threats have been identified.

New Management Actions:

- Collection and propagation for genetic storage and reintroduction—
    - The Center for Island Sustainability (CIS) collected seeds from an unknown number of naturally occurring *Tabernaemontana rotensis* on Guam following extensive typhoon damage in May 2023 (CIS 2023, p. 15). A total of 300 seeds were collected from two locations during September and October 2023. Two hundred of these seeds were used for propagation, resulting in 62 seedlings sprouted in good health and 100 seeds retained in storage.
    - As of 2023, the Guam Plant Extinction Prevention Program (GPEPP) currently has 80 *Tabernaemontana rotensis* seedlings undergoing controlled propagation in their plant nursery and is monitoring 84 outplantings on Guam (GPEPP 2021, p. 1).
    - As of May 2024, the Rota Rare Plant Program has 59 *Tabernaemontana rotensis* seedlings in their nursery and is monitoring 40 outplantings on Rota, all in good health (C. Demapan, pers. comm.).

Table 1. Status and trends of *Tabernaemontana rotensis* 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?
2015 (Listing)	21,000	0	All threats managed in all 3 populations	Partially – some populations protected by fencing (present condition unknown)
			Complete genetic storage	Partially – *ex situ* propagation and seed banking on Guam and Rota
			3 populations with 100 mature individuals each	No – number of mature individuals unknown
2023 (Recovery plan)	15,549	84 on Guam; 30-40 on Rota	All threats managed in all 3 populations	Partially – some populations protected by fencing (present condition unknown)
			Complete genetic storage	Partially– *ex situ* propagation and seed banking on Guam and Rota
			3 populations with 100 mature individuals each	No – number of mature individuals unknown

Table 1b.

Date	No. wild individuals	No. outplanted	*Preventing Extinction Targets identified by HPPRCC	*Preventing Extinction Targets Completed?
2020 (5-year review)	15,341 (including seedlings)	114 on Guam; 30 on Rota	All threats managed in all 3 populations	Partially – some populations protected by fencing (present condition unknown)
			Reproduction (i.e., viable seeds, seedlings, saplings) at all 3 populations	Partially – seed production in some locations
			Complete genetic storage	Partially – *ex situ* propagation and
			3 populations with 25 mature individuals each	No – number of mature individuals unknown
2024 (5-year review)	16,000 (including seedlings)	84 on Guam; 40 on Rota	All threats managed in all 3 populations	Partially – some populations protected by fencing (present condition unknown)
			Complete genetic storage	Partially – *ex situ* propagation and seed banking on Guam and Rota
			Natural reproduction at all 3 populations	Partially – seed production in some locations
			3 populations with 25 mature individuals each	No – number of mature individuals unknown

* 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 *Tabernaemontana rotensis* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Human-mediated habitat destruction and modification	A	Ongoing	Exclosures installed on Rota (one active); Seed collection, propagation, and outplanting on Guam and Rota (GPEPP, CIS, Rota Rare Plant Program)
Degradation and destruction of habitat by feral ungulates	A	Ongoing	Ungulate-proof fencing installed to protect *Tabernaemontana rotensis* at one location on Rota; at least fence on Guam surrounding an area where *T. rotensis* is found
Established ecosystem-altering invasive plant and animal modification and degradation of habitat	A	Ongoing	Brown treesnake control measures on Guam may benefit some populations of *Tabernaemontana rotensis*
Fire destruction and degradation of habitat	A	Ongoing	Department of Defense has developed fire management plans and fuel load reduction programs for some military lands
Habitat alteration and direct mortality from typhoons	A	Ongoing	None
Habitat alteration and direct mortality from climate change	A	Ongoing	None
Herbivory and predation by rodents, caterpillars, mealy bugs, scale insects, and snails	C	Ongoing	None
Ordnance and live fire	E	Ongoing	Live fire management plan in development

Synthesis:
Currently there are more than 16,000 naturally occurring individuals of *Tabernaemontana rotensis* distributed throughout 15 population units on Guam and Rota (including seedlings, immature, and mature plants). The most numerous populations are located in northern Guam (Andersen Main, Northwest Field, Finegayan); all other populations number fewer than 100 individuals and are considered low-resiliency or extremely low-resiliency. *T. rotensis* on Rota are particularly vulnerable, with only nine naturally occurring individuals distributed across five populations (USFWS 2023, p. 19).

Since the previous five-year review, the number of outplanted individuals on Guam has decreased from 114 to 84, primarily due to typhoon impacts, while the number of outplanted individuals on Rota has increased from 30 to 40 (GPEPP 2021 p. 1; C. Demapan, pers. comm.). Forests on both islands sustained damage from Typhoon Mawar in May 2023. After the typhoon, CIS collected a total of 300 seeds from various *T. rotensis* populations on Guam and successfully propagated 62 seedlings, which are currently housed in the CIS plant nursery (CIS 2023, p. 15).

Stabilizing (interim) and preventing extinction targets, and downlisting, and delisting criteria are provided in the Draft 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 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.

Tabernaemontana rotensis is a long-lived perennial tree. To prevent extinction, which is the first milestone in recovering the species, surveys must be completed to document occurrence throughout the species' historic range and the plant's reproductive biology must be studied. 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 Guam and Rota where they now occur or occurred historically and each of these populations must be naturally reproducing (i.e., viable seeds, seedlings, saplings) with a minimum of 25 mature, reproducing individuals per population.

The preventing extinction goals for this species have not been met (Table 1). Although there are at least three subpopulations with greater than 50 individuals, it is uncertain how many individuals are sexually mature, and genetic diversity in a number of populations (including all populations on Rota) is limited. Total population numbers have declined since the 2015 listing, all threats are not being managed, and genetic storage is incomplete (Table 2). Therefore, *Tabernaemontana rotensis* meets the definition of Threatened as it is likely to become an endangered species within the foreseeable future throughout all or a significant portion of 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 reiterated for the 5-year review for 2024.

- Surveys and inventories
  - Conduct surveys to determine the historical range of *Tabernaemontana rotensis* on Guam and Rota.
  - Continue surveys to locate new populations of *Tabernaemontana rotensis* in areas of potentially suitable habitat.
  - Identify suitable locations for reintroduction, especially in areas where management of ungulates and brown tree snakes is planned or already ongoing.
- Ungulate monitoring and control — Maintain existing ungulate exclosures and construct new fences to protect plants from browsing and soil compaction by ungulates.
- Invasive nonnative plant monitoring and control — Continue to manage established ecosystem-altering nonnative invasive plant species, especially those that compete with *Tabernaemontana rotensis*.
- Return pollinators — Facilitate the reintroduction of suitable pollinators to populations of *Tabernaemontana rotensis* in order to create and maintain self-sustaining populations.
- Captive propagation for genetic storage and reintroduction — Collect seeds to maintain optimal genetic diversity of outplanted *Tabernaemontana rotensis*. Continue efforts to propagate, translocate, and monitor outplanted seedlings, with particular focus on supplementing the least numerous populations. Seed banks may serve as a safeguard in the event of extirpation due to catastrophic weather events or wildfires.
- Ordnance and Live Fire Control — Work with the Department of Defense to identify areas where *Tabernaemontana rotensis* may be at risk from live fire training activities and suggest alternative sites.
- Fire prevention and control — Continue to develop and implement fire prevention management plans.
- Climate change adaptation strategy — Research the ecology and habitat needs of *Tabernaemontana rotensis* to inform future viability analyses.
- Predator and herbivore monitoring and control — Identify and implement effective methods to control insect pests such as caterpillars of *Daphnis nerii*.
- Alliance and partnership development — Continue to work with partners and resource managers to plan and implement ecosystem-level restoration and management programs to benefit *Tabernaemontana rotensis*.

References:
[CIS] University of Guam – Center for Island Sustainability (CIS). 2023. Annual Report for Endangered and Threatened Plants Recovery Permit TE-64600C-0. Unpublished report. 16 pp.

Demapan, C. 2024. Email describing the numbers of *Tabernaemontana rotensis* being propagated or monitored by the Rota Rare Plant Program. May 26, 2024.

[GPEPP] Guam Plant Extinction Prevention Program. 2023. Annual Report for Recovery Permit TE-78405C-0. 3 pp.

Guam Plant Extinction Prevention Program (GPEPP). 2015. Progress Report for PIFWO Consolidated Funding FY2014 and 2015. Reporting period Feb 2014 to July 2015. 24 pp.

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

Stone, B. C. 1970. The flora of Guam. Micronesica 6: 1-659.

[UOG] University of Guam (UOG). 2007. Survey of Tabernaemontana rotensis on Anderson Air Force Base, final report, Contract #FA5240-04-P-0099. 74 pp.

[USFWS] U.S. Fish and Wildlife Service. 2020. *Tabernaemontana rotensis* 5-year review summary and evaluation. Pacific Islands Fish and Wildlife Office, Honolulu, Hawaii. 25 pp.

[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.

[USFWS] U.S. Fish and Wildlife Service. 2022. Draft Recovery Plan for 23 Species in the Mariana Islands. Portland, Oregon. xiii+76 pp.

[USFWS] U.S. Fish and Wildlife Service. 2023. Species Report for *Tabernaemontana rotensis*. Pacific Islands Fish and Wildlife Office, Honolulu, Hawaii. 27 pages.

U.S. FISH AND WILDLIFE SERVICE
SIGNATURE PAGE for 5-YEAR REVIEW of *Tabernaemontana rotensis* (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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