

***Mitracarpus maxwelliae* (No Common Name)**

5-Year Status Review:

Summary and Evaluation



Photo by: Carlos Pacheco, U.S. Fish and Wildlife Service

**U.S. Fish and Wildlife Service
Southeast Region
Caribbean Ecological Service Field Office
Mayagüez, Puerto Rico**

May 2023

5-Year Status Review
***Mitracarpus maxwelliae* (no common name)**

GENERAL INFORMATION

Current Classification: Endangered

Date of original listing: October 11, 1994 (59 FR 46715; September 9, 1994)

Lead Field Office: Caribbean Ecological Services Field Office (CESFO), Mayagüez, Puerto Rico, Carlos Pacheco, carlos_pacheco@fws.gov.

Reviewers

Lead Regional Office: Carrie Straight, Southeast Region, Atlanta, GA (404) 679-7226.

Species' Recovery Priority Number at start of 5-year review (48 FR 43098): 5. This indicates the species faces a high degree of threat and has a low recovery potential.

Review History: Previous 5-year status reviews were signed on April 27, 2011 (Service 2011) and April 4, 2018 (Service 2011, 2018). Both reviews recommended no change in status for the species.

Methodology used to complete the review: In accordance with section 4(c)(2) of the Endangered Species Act of 1973, as amended (Act), the purpose of a status review is to assess each threatened species or endangered species to determine whether its status has changed and if it should be classified differently or removed from the Lists of Threatened and Endangered Wildlife and Plants. The U.S. Fish and Wildlife Service (Service) evaluated the biology, habitat, and threats of *Mitracarpus maxwelliae* to inform this status review. In conducting this 5-year status review, we relied on the best available information pertaining to historical and contemporary distributions, life history, genetics, habitats, and threats of this species. To complete this 5-year status review we used the information gathered by the Service since the 2018 *Mitracarpus maxwelliae* 5-year status review.

FR Notice citation announcing the species is under active review

May 13, 2022 (87 FR 29364). No public comments about this species were received during the public comment period.

REVIEW ANALYSIS

Listed Entity

Taxonomy and nomenclature:

No new information regarding taxonomic classification or changes in nomenclature for *Mitracarpus maxwelliae* was found during this review.

Distinct Population Segment (DPS):

The Act defines species as including any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate wildlife. This definition limits listing of a DPS to only vertebrate species. Because the species under review is not a vertebrate, the DPS policy is not applicable.

Recovery Criteria

Recovery Plan

Name of plan: Recovery Plan for *Mitracarpus maxwelliae*, *Mitracarpus polycladus* and *Eugenia woodburyana*, October 6, 1998 (Service 1998)

Amended Recovery Plan for *Mitracarpus maxwelliae*, *Mitracarpus polycladus* and *Eugenia woodburyana*, September 24, 2019 (Service 2019).

The Amended Recovery Plan establishes that *Mitracarpus maxwelliae* could be considered for delisting when the following three criteria are met:

1. Threat reduction and management activities have been implemented to a degree that the species will remain viable into the foreseeable future (address Factor A and Factor E).
2. Existing natural populations of *Mitracarpus maxwelliae* (2 populations) show stable or increasing trend, evidenced by natural recruitment and multiple age classes (address Factor E).
3. Within the historic range, establish at least three (3) new populations of *Mitracarpus maxwelliae* on lands protected by a conservation mechanism that show a stable or increasing trend, evidence by natural recruitment and multiple age classes (addresses Factor A and Factor E).

None of the above delisting criteria have been met.

Distribution, Abundance, Biology and Habitat Summary

No new information on *Mitracarpus maxwelliae*'s biology, distribution, abundance, population trends and changes in habitat conditions was found during this review. A detailed review of the species' biology, distribution, abundance, and its habitat can be found in the previous 5-year status reviews for *Mitracarpus maxwelliae* (Service 2011 and 2018).

Species Distribution

The plant *Mitracarpus maxwelliae*, (Family Rubiaceae), is a mound-like shrub considered endemic to the Municipality of Guánica since the species has not been found anywhere else in Puerto Rico or any other island in the Caribbean Region. Information gathered on *M. maxwelliae*, and discussed in previous reviews, indicates that the number of populations and the

overall number of individuals within its natural range have increased since the species was listed in 1994 (Service 2011 and 2018).

By 2011, *M. maxwelliae* was only known from Monte de la Brea in the Guánica Commonwealth Forest, which is where the species was originally described (Service 2011). In 2018, the species was confirmed to occur in Monte Las Pardas, a Commonwealth land located at 1.63 kilometers (km) (1.01 miles (mi)) northeast of Monte de la Brea (Figure 1; Service 2018). Throughout this new range, the species has a very limited spatial distribution and has a clumped pattern, suggesting that the aggregated distribution is a result of low seed dispersal (Buitrago-Soto 2002, Service 2018). In both populations, the *M. maxwelliae* individuals are found along unpaved roads, trails and growing on dry exposed gravel.

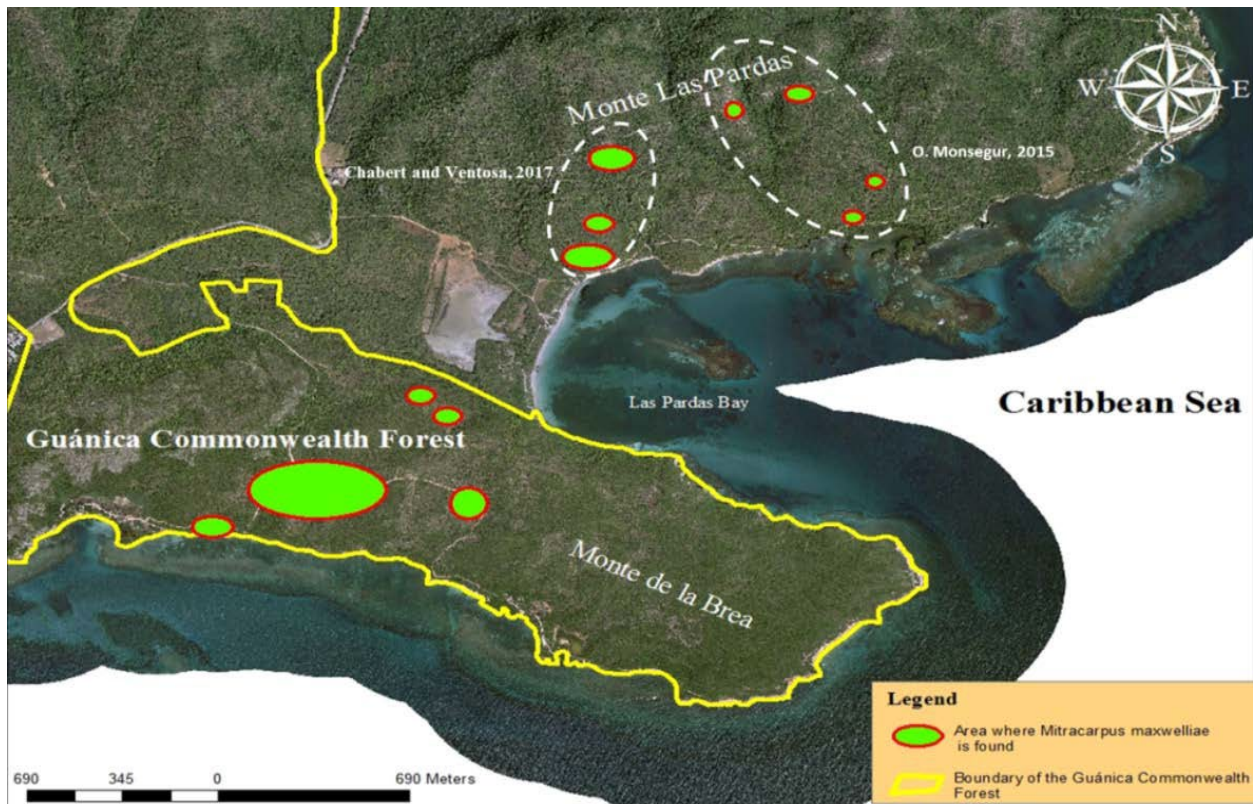


Figure 1. Current distribution indicated by ovals of *Mitracarpus maxwelliae* in the southern karst region found in the Municipality of Guánica in southwest Puerto Rico (Service 2018).

Species Abundance

Since the 2018 5-year review, no new information about the *M. maxwelliae* abundance has been available. In 2011, the abundance of *M. maxwelliae* in Monte de la Brea was estimated at around 1800 individuals (Service 2011). Later in 2018, Service biologists conducted a rapid assessment on the status of *M. maxwelliae* populations at Monte de la Brea, reporting 1,869 adult plants (459 adults with flowers and 1,410 adults without flowers) and 1,431 seedlings within an area of .20 ac (0.08 ha) (Table 1; Service 2018). Although the entire population was not surveyed, they also observed that *M. maxwelliae* seemed to be relatively abundant in the areas not surveyed. In 2017, J. Chabert and E. Ventosa (2017), conducted an inventory on *M. maxwelliae* in Monte Las Pardas, estimating the species population in over 300 adult plants within 2.45 ac (0.99 ha), 3

populations with over 100 adult plants each (Service 2018). Since 2018, the populations of *M. maxwelliae* in Monte de la Brea and in Monte Las Pargas have not been monitored.

Species Biology

No new information about *M. maxwelliae* biology since the 2018 5-year status review for the species. The phenology of *M. maxwelliae* is closely related to the dry and rainy seasons (Buitrago-Soto 2002, Service 2018). Flower production appears to follow peaks of rainfall. Flowers are most frequent from October to December and May to June. No flowers are often seen from February to April and from August to September. Fruits are mainly found between August and October and between January and March following peaks of flowering. The seeds of *M. maxwelliae* have no dormancy. Light and moisture have a significant effect on germination and seedlings survival under experimental conditions (Buitrago-Soto 2002). At the nursery, seed germination and growth are optimal under partial shade and wet soil. In the wild, seedlings’ development begins when water is available. The seedlings’ recruitment of *M. maxwelliae* is high in May, but lower in other months. The plant growth is very slow and shows high variability in green parts growth. Over 20 percent of the branches in adults die during the dry season, especially the branches with infructescence from the previous year. The highest mortality of seedlings has been recorded during June and July, the driest season.

Table 1. Estimated abundance, population status and demographic information for *Mitracarpus maxwelliae* populations in Puerto Rico.

Location	Species Abundance	Population trends	Phenology	Source of information
Monte de la Brea	1,458 plants; 53 seedlings	Stable	Flowers and fruits observed	Buitrago-Soto 2002
Monte de la Brea	1,882 plants	Not provided	Not provided	Ortiz-Prosper 2007
Monte de la Brea	1,869 plants; 1,431 seedlings	Stable	Flowers and fruits observed	Service 2018
Monte Las Pargas	300 plants	Not provided	Not provided	Chabert and Ventosa 2017

Threats (Five-Factor Analysis) Summary

A detailed review of the species’ threats can be found in the 2011 and 2018 *Mitracarpus maxwelliae* 5-year status review (Service 2011, 2018). The status of a species is determined from an assessment of factors specified in section 4 (a)(1) of the Act, including:

- Factor A (the present or threatened destruction, modification, or curtailment of its habitat or range).
- Factor B (overutilization for commercial, recreational, scientific, or educational purposes).
- Factor C (disease or predation).
- Factor D (the inadequacy of existing regulatory mechanisms).

Factor E (other natural or manmade factors affecting its continued existence).

The final listing rule determined that *M. maxwelliae* is threatened by Factor A, Factor D and Factor E (59 FR 46715). In the 2011 and 2018 5-year status reviews, *M. maxwelliae* was considered threatened by the present or threatened destruction, modification, or curtailment of its habitat or range (Factor A) and by other natural or manmade factors affecting its continued existence (Factor E). Presently, we believe that these threats (Factors A and E) continue to apply.

The main localities of *M. maxwelliae* are adjacent to unpaved roads and trails that provide access to natural scenic sites and public beaches (Service 2018). These trails and the access road are heavily used for recreation (i.e., hiking, running, and mountain biking) and offroad vehicles through the year. Improvement or widening of these access roads and trails may result in habitat destruction and modification, and possible losses of individuals of the species (Service 2019). Moreover, the individuals located close to trails and access roads are exposed to damage caused by human trampling.

The *M. maxwelliae* population at Monte Las Pargas is found in an area proposed to be affected by the construction of a tourist development (Service 2018). In 2017, the Guánica Village Partners, LLC proposed to develop the Guánica Dream Hotel on 100 ac (40.8 ha) at Monte Las Pargas. This piece of land harbors *M. maxwelliae* individuals and is part of a bigger parcel of 1090.5 ac (441.3 ha) owned by the Commonwealth of Puerto Rico through the Puerto Rico Land Authority. Since the discovery of the species in Monte Las Pargas, the Service has worked with other Federal and Commonwealth agencies, and with the developers to design and implement conservation measures to avoid or minimize possible impacts on the species. The Service and the developer of this property have developed conservation measures to minimize possible adverse effects of the project on the species (Service 2018). Presently, we have no information indicating that this development has started or is going to start in near future. However, we believe the construction of this project will be delayed due to the precarious fiscal situation of Puerto Rico.

Mitracarpus maxwelliae is threatened by a number of additional threats related to climate, fire, and invasive species (Factor E). It is found only on exposed limestone rocks in the driest section of the Guánica Commonwealth Forest. Severe drought resulting from climate change is believed to negatively impact the species because germination and seedling survival depends on the length of the rainy season as highest mortality of seedlings has been observed during the driest period (Buitrago-Soto 2002). Climate change is expected to result in increases in temperature, intensity of extreme weather (tropical cyclones/hurricanes), storm surge, droughts, sea-level rise, and invasive species. In the Caribbean, flooding frequency is expected to increase, which is in direct response to increases in tropical cyclones (Intergovernmental Panel on Climate Change 2022). The possibility of severe droughts may contribute to an increase in the quantity and frequency of fires on the southern coast of Puerto Rico. The increase in severe or extreme weather may also increase frequency and intensity of other impacts that will damage habitat and individuals.

Additionally, the area where the species occurs is susceptible to human-induced catastrophic events (e.g., fire). Even when the Puerto Rico Department of Natural and Environmental Resources (PRDNER) implement a fire-prevention and management program during the dry

season, human-induced fires are witnessed every year in areas where the species may be present, affecting the suitability of the habitat (Service 2018). Moreover, the species' habitat could be negatively affected by the presence of overgrown stands of grasses (i.e., *Uniola vigata* and *Dichanthium annulatum*). These grasses grow faster than *M. maxwelliae* competing for both water and space and serve as fuel promoting wildfires.

Synthesis

The plant *Mitracarpus maxwelliae* is a mound-like shrub considered endemic Puerto Rico. Presently, the range and distribution of *M. maxwelliae* continues to be restricted to two populations in the municipality of Guánica, one located in the Guánica Commonwealth Forest, which is managed by PRDNER for conservation; and another in Monte Las Pargas, a land proposed for development. The overall abundance *M. maxwelliae* is estimated at approximately 2,150 adult plants clustered in two locations (i.e., Monte de la Brea and Monte Las Pargas). The species continues to be threatened by physical damage caused by human trampling, vehicle traffic, habitat fragmentation, habitat degradation, and loss of individuals caused by human-induced fires, possible competition with grass, and climate change. Because of ongoing threats, the limited number of individuals in only two known locations, and the uncertainty about the current condition of the species, we believe that *Mitracarpus maxwelliae* continues to meet the definition of an endangered species.

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RESULTS / SIGNATURES

**U.S. Fish and Wildlife Service
Status Review of *Mitracarpus maxwelliae***

Status Recommendation

Based on this review, we recommend the following status for this species. A 5-year status review presents a recommendation of the species' status. Any change to the status requires a separate rulemaking process that includes public review and comment, as defined in the Act.

Downlist to Threatened

Delist:

The species is extinct

The species does not meet the definition of an endangered or threatened species

The listed entity does not meet the statutory definition of a species

No change needed; species remains listed as endangered

APPROVAL

Field Supervisor, Caribbean Ecological Services Field Office, Fish and Wildlife Service

Approve _____