***Mitracarpus maxwelliae*, *Mitracarpus polycladus*, and *Eugenia woodburyana* Recovery Plan**
U. S. Fish and Wildlife Service (USFWS). 1998. *Mitracarpus maxwelliae, Mitracarpus polycladus*, and *Eugenia woodburyana* Recovery Plan. Atlanta, Georgia. 19 pp.

Original Approved: 1998
Original Prepared by: Susan Silander

AMENDMENT 1

We have identified best available information that indicates the need to amend recovery criteria for the *Mitracarpus maxwelliae* (no common name), *Mitracarpus polycladus* (no common name), and *Eugenia woodburyana* (no common name) since the recovery plan was completed. In this modification, we synthesize the adequacy of the existing recovery criteria, we show amended recovery criteria, and present the rationale supporting the recovery plan modification. The modification is shown as an addendum that supplements the recovery plan (USFWS 1998), superseding only Part II-A page 8 of the recovery plan. Recovery plans are a non-regulatory document that provides guidance on how best to help recover the species.

For
U.S. Fish and Wildlife Service
Atlanta, Georgia

Approved: _____
Acting **Regional Director, U.S. Fish and Wildlife Service**

Date: 9/24/19

METHODOLOGY USED TO COMPLETE THE RECOVERY PLAN AMENDMENT

The amendments to the recovery criteria are based on recent studies on the species and the information contained in the 2018 5-year Status Review for *Mitracarpus maxwelliae* and *M. polycladus* (USFWS 2018), and in the 2017 5-year Status Review for *E. woodburyana* (USFWS 2017). The information was prepared by U.S. Fish and Wildlife Service (Service) biologists and managers in the Caribbean Ecological Services Field Office (CESFO) in order to develop the delisting criteria for the species.

ADEQUACY OF RECOVERY CRITERIA

Section 4(f)(1)(B)(ii) of the Endangered Species Act (Act) requires that each recovery plan shall incorporate, to the maximum extent practicable, "objective, measurable criteria which, when met, would result in a determination…that the species be removed from the list." Legal challenges to recovery plans (see Fund for Animals v. Babbitt, 903 F. Supp. 96 (D.D.C. 1995)) and a

Government Accountability Audit (GAO 2006) also have affirmed the need to frame recovery criteria in terms of threats assessed under the five listing factors.

Recovery Criteria

See previous version of criteria in *Mitracarpus maxwelliae, Mitracarpus polycladus*, and *Eugenia woodburyana* Recovery Plan at page 8.

Synthesis

Mitracarpus maxwelliae is a small shrub known to occur only in Puerto Rico, with a very limited distribution. Only 2 populations of this species are currently known: one at *Monte de la Brea* and another at *Monte Las Pardas*, both located at La Montalva Ward in the municipality of Guánica. The population at *Monte de la Brea* is within the boundaries of the Guánica Commonwealth Forest (GCF), whereas the population at *Monte Las Pardas* occurs in a public land slated for development. The latest inventory of *M. maxwelliae* indicates that the overall abundance of the species is approximately 2,170 mature individuals and more than 1,430 seedlings (USFWS 2018).

Mitracarpus polycladus is a small shrub known to occur in Puerto Rico, Saba Island in Lesser Antilles, and Anegada Island in British Virgin Islands (BVI) (USFWS 2018). In Puerto Rico, *M. polycladus* occurs in the southern karst region in the municipalities of Guánica, Yauco, and Guayanilla (USFWS 2018). The latest account of *M. polycladus* resulted in approximately 12,470 mature individuals and more than 11,450 seedlings, distributed throughout the GCF, San Francisco Wind Farm (a private property adjacent to the eastern boundary of the GCF), and the Ballena Beach area, a private property located adjacent to the southern boundary of the GCF managed for conservation by Para La Naturaleza (USFWS 2018). In Anegada Island (BVI), Barrios and Hamilton (2018) estimated the *M. polycladus* population as no more than 2,500 individuals. No information is available regarding the current status of the species on Saba island.

Eugenia woodburyana is a small evergreen tree endemic to the southern portion of Puerto Rico and has not been found naturally in other areas of the Island or on other islands in the Caribbean. Currently, *E. woodburyana* is known from about 3,200 individuals in 6 populations along the southern region of Puerto Rico: from the municipality of Cabo Rojo in the south-west, eastward to the municipality of Salinas in the south (USFWS 2017). Additionally, the species has been propagated in tree nurseries and planted at 9 sites: Cabo Rojo National Wildlife Refuge (CRNWR), Laguna Cartagena National Wildlife Refuge (LCNWR), Gabia Farm, Toa Vaca Conservation Area, SCF, *Cueva El Convento*, Caguas Botanical Garden, *Parque Doña Inés*, and Río Piedras Botanical Garden.

The final listing rule determined that *M. maxwelliae*, *M. polycladus* and *E. woodburyana* were threatened by Factor A (habitat destruction and modification), Factor D (inadequacy of existing regulatory mechanisms), and Factor E (other natural or manmade factors) (59 FR 46715).

According to the 5-year status reviews for the *M. maxwelliae* and *M. polycladus* (USFWS 2018)

and for *E. woodburyana* (USFWS 2017), these species continue being threatened by Factor A and Factor E. The species and their habitats continue to be affected by development of residential and tourist projects, unsustainable agricultural practices, and improvement of existing facilities (e.g., trails, access roads) for recreational uses.

The main localities of *M. maxwelliae* and *M. polycladus* at the GCF are adjacent to roads and trails that provide access to natural scenic sites and public beaches.

Improvement or widening of these access roads and trails may result in habitat destruction and modification, and possible losses of individuals of the species. Also, individuals of *M. maxwelliae* at *Montes Las Pardas* are threatened by the construction of a tourist development (USFWS 2018), and *M. polycladus* individuals within the San Francisco Wind Farm can be impacted by the construction of the wind turbines and associated facilities of the proposed wind energy generated project (USFWS 2018).

Currently, 3 of the 6 known *E. woodburyana* populations occur on privately owned lands subject to threats from habitat modification (USFWS 2017). The Service is working with the landowners, developers and federal and local agencies on the development and implementation of conservation measures to minimize possible adverse effects on the species in their properties, or compensate for any impact on these species caused by the proposed projects. All 3 species are also threatened by physical damage caused by human trampling, vehicle traffic, habitat fragmentation and loss of individuals caused by human-induced fires, possible competition by endemic grass (*Uniola vigata*) and the exotic grass (*Dichanthium annulatum*), and climate change.

Severe droughts and sea level rise resulting from climate change is believed to impact these species as *M. maxwelliae* and *M. polycladus* are found growing on sandy and rocky soil near sea level. Also, 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).

Landslides and sediment run-off may poses threats to *E. woodburyana* since the species can be found growing on steep slopes and on deeper sides of natural drainages (USFWS 2017). High rainfall associated with tropical storms and hurricanes may cause floods that in combination with steep topography and highly erodible soils, may lead to mass wasting events, destroying plants and the seed bank. Landslides also create gaps in the vegetation that allow other plant species invade and outcompete the *E. woodburyana*.

AMENDED RECOVERY CRITERIA

Recovery criteria serve as objective, measurable guidelines to assist in determining when an endangered species has recovered to the point that it may be downlisted to threatened, or that the protections afforded by the Act are no longer necessary and *M. maxwelliae*, *M. polycladus*, and *E. woodburyana* may be delisted. Delisting is the removal of a species from the Federal Lists of Endangered and Threatened Wildlife and Plants. Downlisting is the reclassification of a species from an endangered species to a threatened. The term "endangered species" means any species (species, sub-species, or DPS) which is in danger of extinction throughout all or a significant

portion of its range. The term "threatened species" means any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Revisions to the Lists, including delisting or downlisting a species, must reflect determinations made in accordance with sections 4(a)(1) and 4(b) of the Act. Section 4(a)(1) requires that the Secretary determine whether a species is an endangered species or threatened species (or not) because of threats to the species. Section 4(b) of the Act requires that the determination be made "solely on the basis of the best scientific and commercial data available." Thus, while recovery plans provide important guidance to the Service, States, and other partners on methods of minimizing threats to listed species and measurable objectives against which to measure progress towards recovery, they are guidance and not regulatory documents.

Recovery criteria should help indicate when we would anticipate that an analysis of the species' status under section 4(a)(1) would result in a determination that the species is no longer an endangered species or threatened species. A decision to revise the status of or remove a species from the Federal Lists of Endangered and Threatened Wildlife and Plants, however, is ultimately based on an analysis of the best scientific and commercial data then available, regardless of whether that information differs from the recovery plan, which triggers rulemaking. When changing the status of a species, we first propose the action in the *Federal Register* to seek public comment and peer review, followed by a final decision announced in the *Federal Register*.

We provide new delisting criteria for *M. maxwelliae*, *M. polycladus*, and *E. woodburyana*, which will supersede those included in their Recovery Plan. The recovery criteria presented below represent our best assessment of the conditions that would most likely result in a determination that delisting of *M. maxwelliae*, *M. polycladus*, and *E. woodburyana* is warranted as the outcome of a formal five-factor analysis in a subsequent regulatory rulemaking. Achieving the prescribed recovery criteria is an indication that the species is no longer threatened or endangered, but this must be confirmed by a thorough analysis of the five factors.

Amended Delisting Recovery Criteria:

The amended delisting criteria for *M. maxwelliae, M. polycladus* and *E. woodburyana* are as follows:

1. Threat reduction and management activities have been implemented to a degree that the species will remain viable into the foreseeable future (addresses Factor A and Factor E).

2. Existing natural populations of *M. maxwelliae* (2 populations), *M. polycladus* (6 populations) and *E. woodburyan* (6 populations) show a stable or increasing trend, evidenced by natural recruitment and multiple age classes (addresses Factor E).

3. Within the historic range, establish at least three (3) new populations of *M. maxwelliae* and *M. polycladus*, and *E. woodburyana* on lands protected by a conservation mechanism that show a stable or increasing trend, evidenced by natural recruitment and multiple age classes (addresses Factor A and E).

Rationale for Recovery Criteria

The delisting recovery criteria reflect the best available and most up-to-date information on the biology, distribution, and habitat of the *M. maxwelliae, M. polycladus and E. woodburyana*.

Our first recovery priority is to control or eliminate current threats through site-specific conservation measures. According to the latest 5-year Status Reviews, threats discussed under Factor A have been partially addressed for the *M. maxwelliae, M. polycladus and E. woodburyan* located within boundaries of the GCF and the National Wildlife Refuges. However, there are individuals that continue to be threatened by habitat modification from development projects. Additionally, the 5-year Status Reviews included Factor E (other natural or manmade factors) as a threat to *M. maxwelliae*, *M. polycladus* and *E. woodburyana*. Although the GCF is managed for conservation by the Puerto Rico Department of Natural and Environmental Resources, these species continue to be threatened by human trampling, road improvement, human-induced fires and by competition of exotic and native grasses. *Eugenia woodburyana* also is threatened mainly by human-induced fire and landslides in the area of Sierra Bermeja in southwest Puerto Rico (USFWS 2017). Conservation agreements with the private landowners, combined with education are needed to conserve and protect this species on private lands.

To maintain the genetic integrity of these three species and provide adequate representation throughout the species range, the delisting criteria include the management of existing populations aiming to have stable or increasing populations, evidenced by natural recruitment and multiple age classes. The second criterion enhances the probability of persistence of the species by conserving the natural populations and the genetic representation of the species.

With the establishment of additional self-sustainable populations in protected areas, we expect to increase the species distribution and abundance throughout their range. The rationale for this recovery criterion is to enhance the species capability to withstand or bounce back from catastrophic events (e.g., fire) by increasing its distribution and abundance, and maintaining its representation throughout the species range.

ADDITIONAL SITE SPECIFIC RECOVERY ACTIONS

1. Genetic material from all populations is preserved through long-term seed storage and/or propagation efforts. This recovery action should be added as new Task in the recovery plan

LITERATURE CITED

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