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DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS-R4-ES-2021-0058; FF09E22000 FXES1113090FEDR 234]

RIN 1018-BE53

Endangered and Threatened Wildlife and Plants; Reclassifying *Mitracarpus polycladus* from Endangered to Threatened with a Section 4(d) Rule

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), are reclassifying *Mitracarpus polycladus* (a plant, no common name) from endangered to threatened (downlist) under the Endangered Species Act of 1973, as amended (Act). This action is based on our evaluation of the best available scientific and commercial information, which indicates that the species' status has improved such that it is not currently in danger of extinction throughout all or a significant portion of its range, but that it is still likely to become so in the foreseeable future. We are also finalizing a rule issued under section 4(d) of the Act that provides for the conservation of the species.

DATES: This rule is effective [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: The proposed rule, this final rule, and supporting documents are available at <https://www.fws.gov/office/caribbean-ecological-services/library> and at <https://www.regulations.gov> under Docket No. FWS-R4-ES-2021-0058.

FOR FURTHER INFORMATION CONTACT: Edwin Muñiz, Field Supervisor, U.S. Fish and Wildlife Service, Caribbean Ecological Services Field Office, P.O. Box 491, Boquerón, PR 00622; email: Caribbean_es@fws.gov; telephone: (786) 244-0081. Individuals in the United

States who are deaf, deafblind, hard of hearing, or have a speech disability may dial 711 (TTY, TDD, or TeleBraille) to access telecommunications relay services. Individuals outside the United States should use the relay services offered within their country to make international calls to the point-of-contact in the United States.

SUPPLEMENTARY INFORMATION:

Executive Summary

Why we need to publish a rule. Under the Act, a species warrants reclassification from endangered to threatened if it no longer meets the definition of an endangered species (in danger of extinction throughout all or a significant portion of its range). *Mitracarpus polycladus* is listed as endangered, and we are reclassifying *M. polycladus* as threatened (*i.e.*, “downlisting” the species). We have determined *M. polycladus* does not meet the Act’s definition of an endangered species, but it does meet the Act’s definition of a threatened species (likely to become an endangered species throughout all or a significant portion of its range within the foreseeable future). Reclassifying a species as a threatened species can be completed only by issuing a rule through the Administrative Procedure Act rulemaking process (5 U.S.C. 551 *et seq.*).

What this document does. This rule reclassifies *Mitracarpus polycladus* from an endangered to a threatened species on the Federal List of Endangered and Threatened Plants and establishes provisions under section 4(d) of the Act that are necessary and advisable to provide for the conservation of this species (a “4(d) rule”).

The basis for our action. Under the Act, we may determine that a species is an endangered or a threatened species because of any of five factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. We may reclassify a species if the best available commercial and scientific data indicate the species no longer meets the applicable definition in the Act. Based on

the status review, the current threats analysis, and evaluation of conservation measures discussed in this rule, we conclude that *M. polycladus* no longer meets the Act's definition of an endangered species, and should be reclassified to a threatened species. The species is no longer in danger of extinction throughout all or a significant portion of its range, but is likely to become so within the foreseeable future.

We have determined that *Mitracarpus polycladus* is a threatened species due to the following threats: habitat destruction and modification due to road and trail maintenance; trampling by humans; human-caused fires; nonnative, invasive species; urbanization and tourism development; grazing; and the effects of climate change.

Because we are reclassifying *Mitracarpus polycladus* as a threatened species, we are also adopting a 4(d) rule to provide for the conservation of this species.

Previous Federal Actions

Please refer to the June 23, 2022, proposed rule to reclassify *Mitracarpus polycladus* (87 FR 37476) for a detailed description of previous Federal actions concerning this species.

Peer Review

In accordance with our joint policy on peer review published in the *Federal Register* on July 1, 1994 (59 FR 34270), and our August 22, 2016, memorandum updating and clarifying the role of peer review of listing actions under the Act, we solicited independent scientific opinions of the information contained in the June 23, 2022, proposed rule to downlist *Mitracarpus polycladus* (87 FR 37476). We sent the proposed rule to five independent peer reviewers and received one response. The peer review can be found at <https://www.regulations.gov>. In preparing the final rule, we incorporated the results of this review, as appropriate, into this final rule. A summary of the peer review comments and our responses can be found in the **Summary of Comments and Recommendations**, below.

Summary of Changes from the Proposed Rule

In the preamble of the June 23, 2022, proposed rule (87 FR 37476 at p. 37492), we describe our intention to propose to include all of the general exceptions to the prohibition against removing and reducing to possession, as set forth in 50 CFR 17.61, in the 4(d) rule for *Mitracarpus polycladus*. This approach provides our Territorial partners the ability to carry out conservation actions to benefit the species. However, we neglected to include the exceptions set forth at 50 CFR 17.61(c)(2) and (3) in the regulatory text of our proposed rule. In this final rule, we correct that oversight by adding these exceptions to the regulatory text of the 4(d) rule for *Mitracarpus polycladus*. This improves the 4(d) rule's clarity and accuracy, and makes it consistent with our proposed rule's and this final rule's preamble text.

In addition, in this final rule, we make minor, nonsubstantive editorial or stylistic changes and corrections to the June 23, 2022, proposed rule (87 FR 37476).

Summary of Comments and Recommendations

In the proposed rule published on June 23, 2022 (87 FR 37476), we requested that all interested parties submit written comments on the proposal by August 22, 2022. We also contacted appropriate Federal and State agencies, scientific experts and organizations, and other interested parties and invited them to comment on the proposal. Newspaper notices announcing the proposed rule and inviting general public comment were published in Spanish and English in the *Primera Hora* newspaper. We did not receive any requests for a public hearing or any public comments on the proposed rule.

Peer Reviewer Comments

As discussed in **Peer Review**, above, we received comments from one peer reviewer on the proposed rule. We reviewed the peer reviewer's comments for substantive issues and new information regarding the information contained in the proposed rule. The peer reviewer generally concurred with our methods and conclusions and provided additional information,

clarifications, and suggestions to improve the final rule. The peer reviewer's comments are incorporated into this final rule as appropriate.

Peer Reviewer Comments

(1) *Comment:* One peer reviewer provided additional references and updated information and corrections about the Anegada Island population including the following:

- On Anegada Island, *Mitracarpus polycladus* occurs adjacent to an unpaved road on Copper Rock leading to the beach and adjacent to a road to Flash of Beauty, a popular tourist spot.
- On Anegada Island, the population estimate is not definitive, but described as decreased from historical. Where *Mitracarpus polycladus* occurs adjacent to both sides of an unpaved road in one locality, the reviewer concluded that more individuals likely occurred between the two current clusters before the road was constructed.

Our response: We revised our description of the location of *Mitracarpus polycladus* on Anegada Island to reflect the occurrences adjacent to roads or trails, the threat of road and trail maintenance to those localities, and the impact of the road construction on the population trend. We have incorporated the provided information into our analysis in this final rule (see **Summary of Biological Status and Threats** and *Overall Summary of Factors Affecting the Species*, below).

(2) *Comment:* One peer reviewer noted that grazing is a threat to *Mitracarpus polycladus* on Anegada Island and suggested the threat of grazing should be more strongly reflected in the rule.

Our response: We describe the negative impact of grazing on the Anegada Island population in the proposed rule (87 FR 37476, June 23, 2022, at p. 37485) and under *Habitat Destruction and Modification*, below. We agree that grazing on Anegada Island impacts the population, and we more clearly describe the influence of grazing on habitat destruction and modification in this final rule.

(3) *Comment:* One peer reviewer provided information that several seed collections have been made from Anegada Island (most recently in June 2022), which demonstrates that the individuals are reproducing. The reviewer also noted that propagation efforts from plant material from Anegada Island were lost in Hurricane Irma and a February 2022 germination trial was not successful.

Our response: We are encouraged to learn of seed collection efforts and documented reproduction in the Anegada Island population. We have incorporated the information provided by the reviewer regarding the seed collection and propagation efforts into this final rule (see **Background**, below). Recovery efforts for the species, including propagation efforts, are ongoing and additional conservation actions including propagation and transplantation of *M. polycladus* will hopefully support recovery of the species in the future. We do recognize the challenges in propagation of *Mitracarpus*; thus, we did not rely on seed collection or propagation efforts in our status determination. Although the loss of propagated material and failure of the germination trial is unfortunate, the setback of this portion of the recovery effort does not change the species' rangewide condition or our determination that the species meets the definition of a threatened species and should be reclassified.

(4) *Comment:* One peer reviewer questioned the catastrophic impact of storm surge as an effect of climate change on the *Mitracarpus polycladus* that occur near the coast.

Our response: We describe the impact of sea level rise and the effects of climate change on the species in the proposed rule (87 FR 37476, June 23, 2022, at pp. 37485–37486) and under *Effects of Climate Change and Sea Level Rise*, below. We expect the impact to the species from storm surge to be shorter-term compared to the effect of sea level rise as it relates to saltwater exposure. *Mitracarpus polycladus* occurs in areas affected by storm surge from past and recent hurricanes and, as an island species, does not appear to be negatively affected by short-term exposure to saltwater as a result of storm surge and hurricanes. Although some individuals in low-lying areas may be affected by increasing exposure to saltwater for more prolonged periods

in the future, we have determined this threat does not affect *Mitracarpus polycladus* at the species level.

I. Reclassification Determination

Background

A thorough review of the taxonomy, life history, ecology, and overall viability of *Mitracarpus polycladus* was presented in the 5-year status reviews (Service 2011, entire; Service 2018a, entire) and the June 23, 2022, proposed rule (87 FR 37476). Below, we present a summary of the biological and distributional information for *Mitracarpus polycladus*. Please refer to the 5-year reviews and proposed rule for more detailed information.

Taxonomy and Species Description

Mitracarpus polycladus is a small shrub in the Rubiaceae (coffee) family and the *Spermacoce* clade (Bremer 1996, p. 23). *Mitracarpus polycladus* was first collected in Puerto Rico in 1886, and was described in 1903 as a new species (Urban 1903, p. 389; Lioger 1997, p. 124). The taxonomy of the species has not changed since first described. Individuals of this plant species may reach up to 45 centimeters (cm) (17.7 inches (in)) in height, and its stems grow either erect or along the ground (Proctor 1991, p. 127; Lioger 1997, p. 125). The leaves are smooth and narrow, and the inflorescence is made up of smaller white flowers. The seed capsule is very small (1.5 millimeter (mm) (0.06 in) diameter) and contains black seeds (Proctor 1991, p. 127).

Biology

Mitracarpus polycladus colonizes exposed limestone where aggregations of sediment and water provide necessary conditions for seed germination and seedling rooting (Medina et al. 2012, p. 203). The phenology of *M. polycladus* is closely related to the dry and rainy seasons. Flower production occurs just after the peak of rainfall, which may start as early as May and end as late as December, and seed availability occurs during the dry season, which is December to March (Service 2018a, p. 8). The species shows a large reproductive output (high number of

seedlings) after the rainy season followed by a low number of mature adults present during the next rainy season. Seed germination has been observed a few days after a rain event, producing numerous seedlings surrounding mature plants, denoting a clumped spatial distribution (Service 2018b, p. 6). The timing and spatial distribution of seedlings indicate the species produces viable seeds that stay in the soil seedbank until the next rain event (Service 2018b, p. 6).

Although a large number of seedlings (e.g., 1,500 and 13,680 in 2011 and 2018, respectively) have been documented in Puerto Rico, seedling estimates are not included as part of the population abundance estimates because surveyors have been unable to determine seedling survival rates and effective recruitment (Service 2011, p. 24; Service 2018b, p. 8). High mortality of seedlings is observed due to natural thinning of the seedlings and environmental variables (drought stress) (Service 2018b, p. 8). Experts conclude that seeds are dependent on water or wind as a dispersal mechanism, with seeds that are not dispersed by water or wind clumping near the mature plant (Buitrago-Soto 2002, p. 25; Service 2018a, p. 9).

Little information is available regarding *Mitracarpus polycladus*'s pollinators. However, two insect groups (Hymenoptera and Lepidoptera) have been identified as visiting *M. polycladus* flowers and may act as effective pollinators of the species (Monsegur 2017, unpublished data). The observations of multiple insect groups visiting *M. polycladus* support our rationale for defining localities in the Guánica Commonwealth Forest (GCF) area as a single population, as available information indicates the species is cross-pollinated by insects. We expect insect-facilitated cross-pollination is taking place among GCF localities.

Distribution and Abundance

Mitracarpus polycladus was known to occur only in Puerto Rico and on Saba Island (a municipality of the Netherlands) in the Lesser Antilles at the time of listing (59 FR 46715; September 9, 1994). Although the species was discovered on Anegada Island (British Virgin Islands) in 1970, we were not aware of this occurrence at the time of listing (Service 2011, p. 9; Hamilton and Bárrios 2017, p. 1).

When listed, *Mitracarpus polycladus* was known in Puerto Rico only from the Mesetas trail in the GCF (DNR 1976, pp. 56–58; 59 FR 46715, September 9, 1994). No abundance estimates were available for the species in Puerto Rico, and no information was available on the status of the species on Saba Island. When the 1998 recovery plan was finalized, there was little information on *M. polycladus*'s historical and current abundance, distribution, ecology, and reproductive biology. At that time, we described *M. polycladus* occurrences in Puerto Rico and Saba Island as two populations (Proctor 1991, p. 2; Service 1998, p. 2).

At the time of listing and in the subsequent 5-year status reviews, occurrences of *Mitracarpus polycladus* in Puerto Rico were referred to as localities, and the occurrences on Anegada and Saba Islands were referred to as populations due to their distant geographic location. This approach did not consider the species-specific characteristics of clumped spatial distribution, distance among localities, natural geographic barriers, or the species' life-history requirement for cross-pollination. We now have additional information about *M. polycladus*'s geographic and spatial distribution and biological and ecological aspects of the species' life history (e.g., pollinators, seed dispersion, phenology). This information indicates the following natural physical barriers preclude cross-pollination among populations and localities: coastal plains; dense, extensive forest patches; and bays. We also determined that connectivity among localities is required to maximize the likelihood of cross-pollination and gene flow, and to increase fruit production, viable seeds, and natural recruitment to support *M. polycladus* populations.

We now identify three natural populations of *M. polycladus*: (1) Guánica forest in south Puerto Rico (composed of at least 10 localities within the GCF, which is managed for *M. polycladus* conservation, and adjacent lands that provide suitable habitat and connectivity); (2) Saba Island; and (3) Anegada Island. A separate locality, Cerro Toro, was established as a private translocation effort. This population is disjunct (no connectivity nor cross-pollination) from the GCF population; thus, we determined it is a separate, introduced population.

Since the time of listing and the recovery plan development, targeted surveys have provided new abundance and distribution information and incidental observations (see table 1, below) (Service 2007 and 2017, unpublished data). The most recent survey information (see table 2, below) may underestimate population abundance and spatial extent as it did not include three natural localities due to time constraints. Because changes in the habitat have not been observed in the three localities not surveyed, we expect the abundance (number) and spatial extent (hectares (ha)) to be similar to the previous assessments. Therefore, the information from these three localities is unlikely to substantially change the estimates of abundance and extent of occupied area for the population. The increase in the number of localities recorded in Puerto Rico reflects additional survey efforts since the time of listing, while the increase in the number of individuals likely reflects the species' seasonal reproductive response to rain events and timing of surveys (Service 2018b, p. 3).

Table 1. Abundance and Distribution Information for *Mitracarpus polycladus* in the Guánica Commonwealth Forest in Puerto Rico Since 2011.

Year	Number of Localities	Abundance (# of adult plants)	Area occupied in hectares/acres	Source
2011	7	1,400*	n/a	Service 2011, pp. 8, 14
2018	9	12,472	0.42/1.02	Service 2018, p. 22
2018	10	17,637	0.44/1.1	Service 2018b, p. 9

*Includes only 4 localities

In the Puerto Rico population, we are aware of 10 natural localities and 1 introduced locality; 8 natural localities occur in the GCF, and 3 are on private properties (Ballena Beach, Cerro Toro, and Monte de la Ventana, which extends into the GCF) (see table 2, below). We have identified additional potentially suitable habitat for the species, including appropriate vegetation structure and presence of exposed limestone, in aerial images of the GCF. However, this habitat has not been quantified or surveyed, and it is unknown if the species occurs there (Service 2018b, p. 8).

Table 2. Current Abundance and Areal Extent of *Mitracarpus polycladus* at Known Localities in Puerto Rico (Service 2018b, p. 9).

Locality Name	Abundance (# of adult plants)	Area occupied in hectares/acres	Ownership
Caña Gorda	Undetermined	-	Puerto Rico Department of Natural and Environmental Resources (Department)
Jaboncillo	Undetermined	-	Department
Mesetas Trail	13,064	0.255/0.63	Department
Ballena Trail	1,048	0.036/0.09	
La Cueva	310	0.016/0.04	
Hoya Honda	246	0.004/0.01	
State road PR 333	653	0.028/0.07	
Las Picuas	336	0.024/0.06	
Monte de la Ventana	1,967	0.077/0.19	Department and Private
Ballena Beach	Undetermined	-	Private
Cerro Toro	13	0.004/0.01	Private
Total:	17,637	0.44/1.1	

On Saba Island, the best available information indicates the species occurs in several localities along the road between The Bottom and Windward Side towns in the southern section of the island (Rojer 1997, p. 19). No current population estimate is available for Saba Island, and the 1997 assessment does not include a population estimate. On Anegada Island, surveys for *Mitracarpus polycladus* were conducted in 2015, 2016, and 2017, with an estimated population of 2,500 individuals in the north-central region of the island between Windlass Point and Cooper Rock (Bárrios and Hamilton 2018, pp. 3–4).

Habitat

Throughout its range in Puerto Rico, *Mitracarpus polycladus* occurs only on exposed limestone with sediment and water accumulation in holes and crevices. The species is restricted to geographical areas with unique substrate and climate features in dry forest habitat types that serve as corridors for pollinators and facilitate cross-pollination among *M. polycladus* localities

within contiguous habitats. The species occurs among three major types of plant communities: coastal shrub forest, cactus scrub forest, and coastal scrub on sandy soil (DNR 1976, p. 53; Lugo et al. 1978, p. 282; Service 2018b, p. 11). Although these three plant communities occur on approximately 15 percent of the GCF, known occurrences of *M. polycladus* occupy a small total area (0.44 ha (1.1 ac)) where habitat and microhabitat features (i.e., exposed limestone and aggregation of sediment and water) essential for the species are present (Service 2018b, p. 8; see table 2, above). However, surveys have not been conducted throughout the suitable forest types; thus, the species may occur elsewhere within this area. All known *M. polycladus* localities in Puerto Rico fall in the subtropical dry forest life zone. This life zone occupies an area of 121,640 ha (300,576 ac) (Ewel and Whitmore 1973, p. 9) and is the driest life zone in Puerto Rico. It receives a mean annual rainfall of 60–100 cm (24–40 in), experiences high temperatures, and has high evapotranspiration when sufficient water is available (Murphy and Lugo 1986, p. 90; Cáceres-Charneco 2018, p. 27). The climate in this region is seasonal, with most precipitation occurring in September and October (Lugo et al. 1978, p. 278) and another small peak of rainfall in May and June (Sloan et al. 2006, p. 196; Cáceres-Charneco 2018, p. 28).

On Saba Island, the best available information indicates the species occurs on Gile's cherty sandy loam soil found between The Bottom and Windward Side towns. This arid section of the island is located in the south portion of Saba Island (Rojer 1997, p. 19; Freitas *et al.* 2016, p. 10). On Anegada Island, *Mitracarpus polycladus* currently grows on limestone plain and coastal sandy habitats located in the north-central area of this island where the species is restricted to two localities situated between Windlass Point and Cooper Rock (Bárrios and Hamilton 2018, p. 4). This area on Anegada Island has similar environmental conditions and soil characteristics to *M. polycladus* localities in Puerto Rico.

Recovery Criteria

Section 4(f) of the Act directs us to develop and implement recovery plans for the conservation and survival of endangered and threatened species unless we determine that such a

plan will not promote the conservation of the species. Under section 4(f)(1)(B)(ii), recovery plans must, to the maximum extent practicable, include objective, measurable criteria which, when met, would result in a determination, in accordance with the provisions of section 4 of the Act, that the species be removed from the Lists of Endangered and Threatened Wildlife and Plants.

Recovery plans provide a roadmap for us and our partners on methods of enhancing conservation and minimizing threats to listed species, as well as measurable criteria against which to evaluate progress towards recovery and assess the species' likely future condition. However, they are not regulatory documents and do not substitute for the determinations and promulgation of regulations required under section 4(a)(1) of the Act. A decision to revise the status of a species, or to delist a species, is ultimately based on an analysis of the best scientific and commercial data available to determine whether a species is no longer an endangered species or a threatened species, regardless of whether that information differs from the recovery plan.

There are many paths to accomplishing recovery of a species, and recovery may be achieved without all criteria being fully met. For example, one or more criteria may be exceeded while other criteria may not yet be accomplished. In that instance, we may determine that the threats are minimized sufficiently and that the species is robust enough that it no longer meets the Act's definition of an endangered species or threatened species. In other cases, we may discover new recovery opportunities after having finalized the recovery plan. Parties seeking to conserve the species may use these opportunities instead of methods identified in the recovery plan. Likewise, we may learn new information about the species after we finalize the recovery plan. The new information may change the extent to which existing criteria are appropriate for identifying recovery of the species. The recovery of a species is a dynamic process requiring adaptive management that may, or may not, follow all of the guidance provided in a recovery plan.

The initial recovery plan does not provide delisting criteria; however, the revised recovery plan provides three criteria for delisting *Mitracarpus polycladus* (Service 1998, p. 8; Service 2019, p. 4). The three delisting criteria outlined in the revised recovery plan are: (1) Threat reduction and management activities have been implemented to a degree that the species will remain viable into the foreseeable future; (2) existing natural populations of *M. polycladus* show a stable or increasing trend, as evidenced by natural recruitment and multiple age classes; and (3) within the historical range, at least three new populations of *M. polycladus* showing a stable or increasing trend have been established on lands protected by conservation measures, as evidenced by natural recruitment and multiple age classes (Service 2019, entire). Based on the information gathered and analyzed, two of these criteria have been partially met and the third has been initiated. The following discussion provides an assessment of the delisting criteria as they relate to evaluating the status of *M. polycladus*.

Criterion 1 for Delisting

Criterion 1 states that threat reduction and management activities have been implemented to a degree that the species will remain viable into the foreseeable future. Eighty-nine percent of the currently known *Mitracarpus polycladus* in Puerto Rico occur within the GCF, which is managed for conservation by the Puerto Rico Department of Natural and Environmental Resources (Department) (DNR 1976, p. 56). The management actions in the GCF protect *M. polycladus* from development activities and are compatible with the species' needs. The Department lists the species as critically endangered and reviews all proposed actions in the GCF that may impact *M. polycladus* or its habitat (DNRNA 2004, p. 52). The species is also impacted by road maintenance activities (vegetation trimming) in 5 of the 11 localities where the species occurs in Puerto Rico (4 of these localities are within the GCF) (Service 2018b, p. 10). Each of the localities in the GCF has experienced habitat destruction or modification from one or more threats, including intense trail use, human-caused fires, nonnative and invasive species encroachment, and road maintenance. However, the threats have been reduced, and the protected

and managed habitat in the GCF remains a stronghold for the species with the largest number of individuals and areal extent occurring along the Mesetas trail. Thus, although *M. polycladus* is legally protected in this forest, it is subject to actions that limit its abundance and distribution in impacted areas. Two localities on private lands are subject to potential development pressure as discussed under “Urbanization and Development,” below.

Evidence of fire has been recorded on or adjacent to two *Mitracarpus polycladus* localities (Service 2018a, p. 27). The species does not colonize previously burned areas; therefore, fire can be a threat to species viability, as *M. polycladus* is endemic to dry limestone forest where vegetation did not evolve under a natural fire regime (Service 2018b, p. 12).

These threats of fire, development, nonnative and invasive species, and road and trail maintenance, coupled with competition with other plant species for specific habitat requirements such as holes and cracks for seed germination, and observed lack of dispersal mechanisms, reduce the species’ ability to colonize other areas. Therefore, we determined that, while threat reduction and management activities at GCF have been implemented and have improved the species’ viability, they have not been implemented or improved viability to a degree that the species will maintain viability into the foreseeable future. Thus, we conclude that this criterion has been partially met.

Criterion 2 for Delisting

Criterion 2 states that existing natural populations of *Mitracarpus polycladus* show a stable or increasing trend, as evidenced by natural recruitment and multiple age classes. Since the time of listing, the number of individuals and localities reported for *M. polycladus* have increased. Approximately 17,624 adult *M. polycladus* individuals are currently distributed in 10 natural localities in Puerto Rico occupying 0.44 ha (1.1 ac), with documented recruitment as evidenced by numerous seedlings in close proximity to adult plants, particularly after rain events. However, existing data indicate that seedlings’ survival is uncertain due to natural thinning and environmental stochasticity (drought stress). However, effective recruitment has occurred, and

seedlings and saplings were noted in seven of eight localities with abundance, seedling, and sapling counts in Puerto Rico during the 2018 assessment (Service 2018b, p. 9). Habitat modification caused by human-caused fires and subsequent encroachment of nonnative grasses has resulted in the loss of some clusters of individuals within a locality. Habitat modification and other threats, discussed below under **Summary of Biological Status and Threats**, may preclude the expansion of the species within known suitable habitats in Puerto Rico. The population trend on Anegada Island has been described as decreasing due to the removal of some individuals in one locality from past road construction. Seed collections have occurred recently in the Anegada Island population, indicating reproduction, although the level of recruitment in that population is unknown (Bárrios 2023, pers. comm.). The status and trend of the *M. polycladus* population on Saba Island, including reproduction and recruitment, is currently unknown.

Based on the uncertainty of population estimates and the lack of evidence of expansion into suitable habitat, we determined that a stable or increasing trend, as evidenced by natural recruitment and multiple age classes, has been met in Puerto Rico, but not on Saba or Anegada Islands. Thus, we conclude that this criterion has been partially met.

Criterion 3 for Delisting

Criterion 3 states that at least three new populations of *Mitracarpus polycladus* showing a stable or increasing trend have been established within the historical range on lands protected by conservation, as evidenced by natural recruitment and multiple age classes. In Cerro Toro, an undetermined number of *M. polycladus* individuals were translocated from the Monte de la Ventana locality by the landowner to establish a new population of the species physically separated from the GCF population. As of 2018, 13 of the planted individuals were still alive (Service 2018b, p. 9; see table 2, above), but no recruitment (seedlings or saplings) was observed. However, this recovery effort has not been expanded. The Royal Botanic Gardens (Kew), in collaboration with the National Park Trust of the Virgin Islands, has made effort to propagate material from *M. polycladus* on Anegada Island, but no planting efforts have been

implemented. No further efforts of translocations or propagation and reintroduction are currently known. To increase the species' redundancy and long-term viability, additional populations should be established through translocation and/or propagation throughout the species' range. Thus, we conclude that this criterion has been initiated, but not met.

Regulatory and Analytical Framework

Regulatory Framework

Section 4 of the Act (16 U.S.C. 1533) and the implementing regulations in title 50 of the Code of Federal Regulations set forth the procedures for determining whether a species is an endangered species or a threatened species, issuing protective regulations for threatened species, and designating critical habitat for endangered and threatened species. In 2019, jointly with the National Marine Fisheries Service, the Service issued a final rule that revised the regulations in 50 CFR part 424 regarding how we add, remove, and reclassify endangered and threatened species and the criteria for designating listed species' critical habitat (84 FR 45020; August 27, 2019). On the same day, the Service also issued final regulations that, for species listed as threatened species after September 26, 2019, eliminated the Service's general protective regulations automatically applying to threatened species the prohibitions that section 9 of the Act applies to endangered species (84 FR 44753; August 27, 2019).

The Act defines an "endangered species" as a species that is in danger of extinction throughout all or a significant portion of its range, and a "threatened species" as a species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. The Act requires that we determine whether any species is an endangered species or a threatened species because of any of the following factors:

- (A) The present or threatened destruction, modification, or curtailment of its habitat or range;
- (B) Overutilization for commercial, recreational, scientific, or educational purposes;
- (C) Disease or predation;

(D) The inadequacy of existing regulatory mechanisms; or

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

These factors represent broad categories of natural or human-caused actions or conditions that could have an effect on a species' continued existence. In evaluating these actions and conditions, we look for those that may have a negative effect on individuals of the species, as well as other actions or conditions that may ameliorate any negative effects or may have positive effects. We consider these same five factors in downlisting a species from endangered to threatened.

We use the term “threat” to refer in general to actions or conditions that are known to or are reasonably likely to negatively affect individuals of a species. The term “threat” includes actions or conditions that have a direct impact on individuals (direct impacts), as well as those that affect individuals through alteration of their habitat or required resources (stressors). The term “threat” may encompass—either together or separately—the source of the action or condition or the action or condition itself.

However, the mere identification of any threat(s) does not necessarily mean that the species meets the statutory definition of an “endangered species” or a “threatened species.” In determining whether a species meets either definition, we must evaluate all identified threats by considering the species' expected response by and the effects of the threats—in light of those actions and conditions that will ameliorate the threats—on an individual, population, and species level. We evaluate each threat and its expected effects on the species, then analyze the cumulative effect of all of the threats on the species as a whole. We also consider the cumulative effect of the threats in light of those actions and conditions that will have positive effects on the species—such as any existing regulatory mechanisms or conservation efforts. The Secretary of the Interior (Secretary) determines whether the species meets the definition of an “endangered species” or a “threatened species” only after conducting this cumulative analysis and describing the expected effect on the species now and in the foreseeable future.

The Act does not define the term “foreseeable future,” which appears in the statutory definition of “threatened species.” Our implementing regulations at 50 CFR 424.11(d) set forth a framework for evaluating the foreseeable future on a case-by-case basis. The term “foreseeable future” extends only so far into the future as we can reasonably determine that both the future threats and the species’ responses to those threats are likely. In other words, the foreseeable future is the period of time in which we can make reliable predictions. “Reliable” does not mean “certain”; it means sufficient to provide a reasonable degree of confidence in the prediction. Thus, a prediction is reliable if it is reasonable to depend on it when making decisions.

It is not always possible or necessary to define foreseeable future as a particular number of years. Analysis of the foreseeable future uses the best scientific and commercial data available and should consider the timeframes applicable to the relevant threats and to the species’ likely responses to those threats in view of its life-history characteristics. Data that are typically relevant to assessing the species’ biological response include species-specific factors such as lifespan, reproductive rates or productivity, certain behaviors, and other demographic factors.

Analytical Framework

To assess *Mitracarpus polycladus* viability, we used the three conservation biology principles of resiliency, redundancy, and representation (Shaffer and Stein 2000, pp. 306–310). Briefly, resiliency is the ability of the species to withstand environmental and demographic stochasticity (for example, wet or dry, warm or cold years); redundancy is the ability of the species to withstand catastrophic events (for example, droughts, large pollution events); and representation is the ability of the species to adapt to both near-term and long-term changes in the physical and biological environment (for example, climate conditions, pathogens). In general, species viability will increase with increases in resiliency, redundancy, and representation (Smith et al. 2018, p. 306). Using these principles, we identified the species’ ecological requirements for survival and reproduction at the individual, population, and species levels, and described the beneficial and risk factors influencing the species’ viability.

Summary of Biological Status and Threats

In this discussion, we review the biological condition of the species and its resources, and the threats that influence the species' current and future condition, in order to assess the species' overall viability and the risks to that viability. In addition, the 5-year reviews (Service 2011, entire; Service 2018a, entire) and our proposed rule (87 FR 37476; June 23, 2022) document our comprehensive biological status review for the species, including an assessment of the potential threats to the species.

The following is a summary of these status reviews and the best available information gathered since that time that have informed this decision. For additional information and details regarding the current, ongoing, and future threats to the species, see the June 23, 2022, proposed rule (87 FR 37476).

Habitat Destruction and Modification

Habitat destruction and modification were identified as factors affecting the continued existence of *Mitracarpus polycladus* at the time of listing (59 FR 46715; September 9, 1994). Road and trail maintenance, human-caused fire, nonnative and invasive species, urbanization and tourism development, and grazing continue to contribute to the destruction and modification of *M. polycladus* habitat and are summarized below. Although changes to habitat conditions may affect pollinator abundance and distribution, available information does not indicate that a loss of pollinators is occurring in *M. polycladus* habitat, and we expect that sufficient pollinators are present to cross-pollinate within the pollinator's flight distance.

Roads and Trails Maintenance

Currently, in Puerto Rico, *Mitracarpus polycladus* occurs adjacent to or along paved and unpaved roads, parking areas, and trails that provide access to recreational areas in seven localities in the dry southern section of the GCF (Service 2018b, p. 5). These roads and trails are managed by the Department as scenic trails and natural areas. However, management and maintenance activities, primarily vegetation trimming, have affected *M. polycladus* individuals

in these areas (Service 2018b, p. 10). Similarly, the Puerto Rico Department of Transportation and Public Works right-of-way maintenance causes impacts to individuals and habitat in the State Road PR 333 locality (Service 2018b, p. 10). Right-of-way maintenance activities have resulted in mortality of reproductive *M. polycladus* individuals in three localities and may reduce production of seeds and potential seedlings in these localities if the plants do not recover sufficiently to reproduce when conditions are suitable (Service 2018b, p. 10).

The largest known *Mitracarpus polycladus* cluster occurs adjacent to the heavily used Mesetas trail in GCF with 13,064 individuals occupying an area of 0.255 ha (0.63 ac). Approximately 25 to 30 percent of *M. polycladus* along the trail in this locality are exposed to damage caused by trail maintenance and human trampling (Service 2018b, pp. 10–11). Physical impacts to *M. polycladus* and its habitat are caused by the frequent use of the scenic trails and adjacent habitat in the GCF by residents and tourists for recreational activities (i.e., hiking, running, and mountain biking) throughout the year (Service 2018a, p. 12).

Nonnative grass encroachment along trails follows a similar pattern to encroachment following fire and is described below. The Anegada Island population occurs adjacent to two trails or roads, and the species occurs along roads and trails in Puerto Rico. However, we expect that the effects of road and trail maintenance on the *M. polycladus* populations are limited to a small number of individuals closest to the road or trail edge. Although over half of localities and several thousand individuals are exposed to the threat of road and trail maintenance, available information indicates that this threat does not have a population-level or species-level impact.

Human-caused Fire

Fires are not a natural event in the subtropical dry forests in Puerto Rico, and the native vegetation in the Caribbean is not adapted to this type of disturbance (Brandeis and Woodall 2008, p. 557; Santiago-García et al. 2008, p. 604). Human-caused fires were identified as a threat to the species when listed (59 FR 46715; September 9, 1994) and continue to occur throughout *Mitracarpus polycladus* habitat in Puerto Rico (Service 2018a, p. 27). Currently, 6 of 10 natural

localities of *M. polycladus* occur in areas vulnerable to or at high risk of human-caused fires, particularly during the dry season (Service 2018b, p. 10). Although the Department implements a fire prevention and management program in the GCF during the dry season, fires still occur and impact *M. polycladus* and its habitat (Service 2018b, p. 11).

Fire affects *Mitracarpus polycladus* survival through impacts of heat and encroachment of nonnative, invasive plant species. Nonnative plant species outcompete *M. polycladus* and serve as fuel for fires (García-Cancel 2013, pp. 19, 33; Service 2018a, p. 27). The interaction of fire and nonnative species is described under “Nonnative, Invasive Species,” below. Moreover, *M. polycladus* does not grow in areas with visible evidence of past fires (Service 2018b, p. 11). This is likely due to destruction or loss of the seedbank, precluding species germination and recolonization of an area from the seedbank after a fire.

Fires destroy or reduce native vegetation through direct impacts to individuals and to the seedbank (which is not fire-adapted) (Wolfe 2009, p. 28). Fires reduce or eliminate *Mitracarpus polycladus* seeds in the seedbank and promote favorable conditions for the establishment of nonnative, invasive plant species. These species, such as guinea grass (*Megathyrsus maximus*), pajón grass (*Dichanthium annulatum*), and buffel grass (*Cenchrus ciliaris*), are adapted to a natural fire regime and serve as fuel for fires, thus promoting conditions for a more frequent fire regime that precludes the establishment of native vegetation, including *M. polycladus* (Thaxton et al. 2012, p. 9). This pattern occurs in *M. polycladus* habitat in the GCF, where nonnative grasses are present and *M. polycladus* is not observed (García-Cancel 2013, entire; Service 2018b, p. 12). Other factors such as seed predation, seed intrinsic viability, and seedling survival also affect forest recovery after fire. In *M. polycladus* habitat, fires promote habitat fragmentation, return habitat to an earlier successional state, and slow forest recovery processes (Brandeis and Woodall 2008, p. 557; Meddens et al. 2008, p. 569).

Fire negatively impacts *Mitracarpus polycladus* and its habitat, and the capacity of the species to recover from catastrophic fire events is unknown. Moreover, *M. polycladus* occurs in

areas with high vulnerability to fires, exacerbating the potential effects of fire on individuals and populations. The effects of climate change and nonnative, invasive species may alter conditions in *M. polycladus* habitat to promote increased susceptibility to fire (as described under “Nonnative, Invasive Species,” below). Therefore, even with the Department’s current fire prevention and management program efforts during the dry season, human-caused fires occur every year within the species’ range. Fires in *M. polycladus* localities affect the survival and recruitment of individuals, population resiliency, and, potentially, the species’ viability (Service 2018b, p. 11). Information regarding the threat of fire to the Anegada and Saba Island populations is less extensive than the information for Puerto Rico; however, we expect the threat of human-caused fire is similar since the Anegada and Saba Island populations also occur along roadsides.

Nonnative, Invasive Species

Caribbean dry forests generally have seedbanks with low numbers and variety of species, and forest regeneration in areas disturbed through mechanical vegetation removal or through burning is largely dependent on propagules or seeds from nearby habitats (Wolfe 2009, p. 28). Nonnative species typically become established more quickly and may have less specific habitat or life-history requirements than native species. When nonnative species become established in a disturbed habitat, they outcompete native species for resources, including space, nutrients, water, and sunlight. The impacts of nonnative, invasive species are second only to habitat destruction and modification and are among the greatest threats to the persistence of native rare species and their habitats in Puerto Rico (Thomson 2005, p. 615; García-Cancel 2013, entire). Nonnative species like guinea grass, buffel grass, pajón grass, and African grass (*Heteropogon contortus*) aggressively colonize and compete with native species for sunlight, nutrients, water, and ground cover (space), suppressing native vegetation (García-Cancel 2013, entire; Rojas-Sandoval and Meléndez-Ackerman 2016, p. 156; Service 2018b, p. 12). In addition, *M. polycladus* does not occur in areas occupied (or dominated) by nonnative grasses at localities in the GCF (García-

Cancel 2013, entire; Service 2018b, p. 12). Nonnative trees (e.g., lead tree (*Leucaena leucocephala*)) also colonize *M. polycladus* habitat, particularly after fire events, and suppress the growth of native vegetation (Wolfe and Van Bloem 2012, entire).

In areas where *Mitracarpus polycladus* is established, nonnative species do not appear to reduce habitat directly by displacing existing *M. polycladus* individuals, but primarily impact populations by preventing or reducing colonization by the species when the area is disturbed. In summary, nonnative invasive species outcompete *M. polycladus* for required resources, promote increased frequency and intensity of fire, and prevent establishment of seedlings, thus impacting *M. polycladus* at the individual, population, and, potentially, species levels.

Urbanization and Development

One *Mitracarpus polycladus* locality occurs within the project area of a proposed wind generation project (San Francisco Wind Farm) in Monte de la Ventana. This project occupies 79 ha (195 ac) of dry forest habitat with 1,967 *M. polycladus* individuals in the project area (Service 2018b, pp. 1, 11). Ninety-six percent of *M. polycladus* individuals on the site occur on and adjacent to now-abandoned roads accessing the site. The wind farm construction project is covered by an incidental take permit under a habitat conservation plan (HCP) that includes conservation measures to minimize adverse effects to listed species in the project area (Service 2013, p. 3). Although a substantial portion of this property is identified as a conservation area under the HCP, the conservation areas do not include habitat for *M. polycladus* (Service 2013, p. 3). The species grows in open areas (e.g., dirt roads and wind turbine pads in the project area) where it is vulnerable to effects from the project's operations, including impacts from maintenance activities, vehicle traffic, and habitat encroachment by nonnative, invasive plants. To date, this wind farm project has not been constructed, but we have no indication that the project is abandoned.

The Ballena beach locality has been subject to development pressure in the past with proposals for the development of a hotel in that area. Although this hotel development project has not been constructed, it may be pursued in the future.

Mitracarpus polycladus occurrences on Anegada and Saba Islands are also threatened by development. On Anegada Island, in the British Virgin Islands, the potential for island-wide development exists, with local community support and road improvement works underway (Hamilton 2016, p. 185). Anegada Island has been recognized by its government as an undeveloped island with high potential for tourism development due to the beauty of its natural resources (sandy beaches and coral reefs). In 2007, the Government of Anegada developed a land use plan (Plan) designating areas for commercial and residential purposes, hotel development, agriculture, community parks and recreational areas, a business district, protection and conservation, and government offices and related facilities (Island Resources Foundation (IRF) 2013, p. 24). The Plan proposes to set aside some areas for conservation (IRF 2013, p. 25); however, the proposed areas do not contain *M. polycladus* or its habitat. If the Plan is enacted fully, we expect *M. polycladus* and its habitat to be reduced or eliminated by the proposed development of the island. Although urbanization and development plans for Saba Island (a municipality of the Netherlands) are unknown, the potential for urbanization and tourism development is present.

Grazing

On Anegada and Saba Islands, *Mitracarpus polycladus* habitat has been degraded by the grazing of feral livestock, such as goats and donkeys (Freitas et al. 2016, p. 21; Bárrios and Hamilton 2018, p. 5; Hamilton 2020, pers. comm.). Livestock presence and grazing leads to an increase in soil erosion while foraging, as observed on Saba Island (Freitas et al. 2016, p. 21). These animals also trample *M. polycladus* individuals, reduce its abundance, and affect the population structure. The best available information indicates feral livestock grazing may currently impact the Anegada and Saba Island populations.

In summary, impacts associated with habitat destruction and modification due to vegetation clearance for maintenance and improvement activities of roads and trails, urbanization and tourism development, human-caused fires, and encroachment of nonnative plant species have been documented as current and ongoing threats to *Mitracarpus polycladus* throughout its range. In Puerto Rico, although about 89 percent of *M. polycladus* individuals occur within the GCF, the species and its habitat are impacted by the rangewide threats, although development is less likely in the GCF compared to lands in private ownership. Human-caused fires have been documented in *M. polycladus* habitat even when fire management practices are implemented during the dry season. The remaining 11 percent of the individuals on Puerto Rico occur on private lands not managed for conservation, where habitat destruction and modification resulting from road clearing and wind farm development and operation may impact individuals and localities. All *M. polycladus* individuals on Saba Island and Anegada Island occur on private lands and are not purposefully managed for conservation. Occurrences on Saba Island are subject to threats of grazing and human-induced fire, and potentially to the threat of urbanization and development. *Mitracarpus polycladus* on Anegada Island are at risk due to grazing, urbanization and development, and human-induced fire.

Limited Distribution and Small Population Size

At the time of listing, we identified the species' limited distribution (i.e., two isolated populations: one in Puerto Rico and one on Saba Island) coupled with an undetermined but presumably low number of individuals (i.e., no abundance information was available) as the primary threats to the species. Since listing, our knowledge concerning *Mitracarpus polycladus*'s abundance and distribution has improved, and we are aware of increased individuals and localities throughout the southern section of the GCF (Service 2018a, p. 22). Currently, there are three known natural populations (Puerto Rico, Saba Island, Anegada Island) and one introduced population occurring on three Caribbean islands across the species' historical range. The species is restricted to small clusters on exposed limestone, occupying a total area of 0.44 ha (1.1 ac) in

southern Puerto Rico (no areal extent is estimated for the populations on Anegada and Saba Islands). The limited distribution of the four populations makes *M. polycladus* vulnerable to catastrophic events (e.g., widespread and severe drought and large-scale fires).

Small population size can exacerbate other threats acting on the species. Populations that are small, isolated by habitat loss or fragmentation, or impacted by other factors are more vulnerable to extirpation by natural, randomly occurring events (such as predation or stochastic weather events), and to genetic effects that plague small populations, collectively known as small population effects (Purvis et al. 2000, p. 1947). These effects can include genetic drift, founder effects (over time, an increasing percentage of the population inheriting a narrow range of traits), and genetic bottlenecks leading to increasingly lower genetic diversity, with consequent negative effects on adaptive capacity and reproductive success (Keller and Waller 2002, p. 235).

Nine natural localities on Puerto Rico are smaller localities with varying degrees of connectivity and cross-pollination between localities; in contrast, only one natural locality, the Mesetas trail locality in GCF, has a high number of individuals and connectivity. The best available information for Anegada and Saba Islands indicates that these populations are currently small (2,500 on Anegada Island and unknown abundance on Saba Island) and in a few localities with limited distribution.

Effects of Climate Change and Sea Level Rise

The Intergovernmental Panel on Climate Change (IPCC) concluded that evidence of warming of the climate system is unequivocal (IPCC 2014, pp. 2, 40). Observed effects associated with climate change include widespread changes in precipitation amounts, increased extreme weather events including droughts, heavy precipitation, heat waves, more intense tropical cyclones, and an increase in sea level (IPCC 2014, pp. 40–44). Rather than assessing climate change as a single threat in and of itself, we examined the potential consequences to the species and its habitat that arise from changes in environmental conditions associated with various aspects of climate change (temperature, precipitation, and sea level rise). Vulnerability to

climate change impacts can be defined as a function of sensitivity, exposure, and adaptive capacity of the species to those changes (IPCC 2007, pp. 6, 21; Glick and Stein 2010, p. 19).

The IPCC-modelled scenarios for the Caribbean islands predict precipitation declines, sea level rise, stronger and more frequent extreme weather events, and temperature increases by 2050 (Penn 2010, p. 45; Khalyani et al. 2016, p. 265; Gould et al. 2018, p. 813; Strauss and Kulp 2018, p. 3; U.S. Global Change Research Program (USGCRP) 2018, p. 136). We examined a downscaled model for Puerto Rico and the British Virgin Islands based on global emissions scenarios from the Climate Model Intercomparison Project (CMIP3) dataset. The more current CMIP5 dataset was not available for the species' range at the time of analysis. The Special Report on Emissions (SRES) scenarios using the CMIP3 dataset are generally comparable to the more recent representative concentration pathway (RCP) scenarios from RCP4.5 (SRES B1) to RCP8.5 (SRES A2) (Lorde 2011, entire; IPCC 2014, p. 57; Khalyani et al. 2016, pp. 267, 279–280). Under both scenarios, emissions increase, precipitation declines, and temperature and total dry days increase, resulting in extreme drought conditions that convert subtropical dry forest into dry and very dry forest (Khalyani et al. 2016, p. 280).

Modeling shows dramatic changes to Puerto Rico through 2100; however, the divergence in these projections increases after mid-century (Khalyani et al. 2016, p. 275). By 2050, Puerto Rico is predicted to be subject to a decrease in rainfall, along with increased drought intensity (Khalyani et al. 2016 p. 265; USGCRP 2018, p. 136). As precipitation decreases, influenced by warming, it will tend to accelerate the hydrological cycles, resulting in wet and dry extremes (Cashman et al. 2010, pp. 1, 51, 53; Jennings et al. 2014, pp. 1, 5–6). A reduction in precipitation in the subtropical dry forests, where rain events are already limited, will affect *Mitracarpus polycladus* viability through reduced seed viability and result in increased seedling mortality. Droughts compromise seedling recruitment as evidenced following dry periods, when seedling and adult mortality is the highest and other individuals show partial die-off (Service 2018b, p. 8). In fact, under experimental conditions, the germination and survival of seedlings of the closely

related *M. maxwelliae* were negatively affected by reduced soil moisture (Buitrago-Soto 2002, p. 25). There are indications that the southern region of Puerto Rico, where *M. polycladus* occurs, has experienced negative trends in annual rainfall. Between 2000 and 2016, Puerto Rico had seven drought episodes concentrated around the south, east, and southeastern regions of the island. The most severe drought occurred between 2014 and 2016, when Puerto Rico experienced 80 consecutive weeks of moderate drought, 48 weeks of severe drought, and 33 weeks of extreme drought conditions (Alvarez-Berríos et al. 2018, p. 1). Prolonged dry seasons may represent a bottleneck for seedlings and promote changes in the composition of recruits of plant species (Allen et al. 2017, p. 6). Additionally, prolonged droughts and associated changes in soil conditions (i.e., temperature and soil humidity) would result in conditions promoting fire throughout *M. polycladus*'s range, impacting individuals and reducing seed viability, and therefore species' recruitment. Moreover, the absence of forest canopy on the exposed limestone substrate where *M. polycladus* occurs reduces suitable habitat conditions (i.e., hydrology and moisture retention) that buffer the severity of stress resulting from environmental perturbations, such as droughts.

The IPCC global models and scenarios analyzed for the downscaled models apply to the Caribbean islands. Downscaled general circulation models predict dramatic shifts in the life zones of Puerto Rico with potential loss of subtropical rain, moist, and wet forest, and with the appearance of tropical dry and very dry forests anticipated (Khalyani et al. 2016, p. 275). Some species may move to higher elevations in response to this shift in life zones; however, the extent of a species' ability to redistribute will depend on its dispersal capability and forest connectivity (Khalyani et al. 2019, p. 11). Due to *Mitracarpus polycladus*'s low dispersal capability, clumped spatial distribution, and habitat requirements (exposed limestone), as well as the limited availability of its required habitat, a shift from dry to very dry forest is expected to affect species' viability because of a lack of suitable habitat and the species' inability to move to suitable habitat. Based on the similarity of habitat and geographic proximity, the effects of climate

change on Anegada and Saba Islands are expected to be similar to Puerto Rico as emissions increase, precipitation declines, and temperature and total dry days increase, resulting in extreme drought conditions that convert subtropical dry forest into dry and very dry forest (Khalyani et al. 2016, entire). In the subtropical dry forest habitat where *M. polycladus* occurs, climate change may impact the species through declines in natural recruitment and population expansion.

Sea level rise is another expected effect of climate change that may affect coastal communities and habitat in the Caribbean islands (Penn 2010, entire; Lorde 2011, entire; Strauss and Kulp 2018, p. 1). Integrated sea level rise projection and flood risk analysis predict that floods reaching 0.5 meter (m) (1.64 feet (ft)) above current high tide levels will become common events throughout most of the Caribbean by 2050 (Strauss and Kulp 2018, p. 2). Other scenarios using RCP4.5 and RCP8.5 forecast that by mid-century, sea level is expected to increase by 0.24 m (0.8 ft) to 0.85 m (2.8 ft) (Church et al. 2013, p. 1182; Sweet et al. 2017, p. 75; Strauss and Kulp 2018, p. 14). Based on these sea level rise projections, coastal floods will negatively affect *Mitracarpus polycladus* habitat at or below the 1.0 m (3.3 ft) sea level near the coast or in areas with high coastal erosion through the effects of saltwater inundation. In Puerto Rico, *M. polycladus* occurs at elevations ranging from 1.5 m (5 ft) to 52 m (172 ft) from current sea level (Service 2018b, p. 5). On Saba Island, *M. polycladus* occurs at an elevation ranging from 12 m (40 ft) to 335 m (1,100 ft) (Rojer 1997, p. 19; Freitas et al. 2016, p. 10). On Anegada Island, *M. polycladus* occurs at elevations ranging from 1 m (3.2 ft) to 8 m (26 ft) from current sea level (Bárrios 2021, pers. comm.; Hamilton 2021, pers. comm.). Across the range, the only known locality in an area with potential to be affected by flooding and sea level rise is the Windlass site on Anegada Island (approximately 200 *M. polycladus* individuals). The Windlass site is located in the sandy and rocky areas on the northern coast of the island where the habitat is subjected to high energy wave and coastal erosion (Bárrios and Hamilton 2018, p. 5). *Mitracarpus polycladus* individuals occur in elevations higher than those we expect to be impacted by sea level rise on Puerto Rico, Saba Island, and other localities on Anegada Island. Based on predicted sea level

rise and the elevation where most individuals occur, we determined sea level rise does not pose a threat to the species in the foreseeable future. Nevertheless, sea level rise may indirectly impact the species, particularly on Anegada Island, through development associated with displacement of the human population from coastal areas to inland and urban areas where individuals of *M. polycladus* occur (Penn 2010, pp. 21, 249; Hamilton 2016, p. 101). We do not expect significant effects to *M. polycladus* from sea level rise, although one coastal locality on Anegada Island has the potential to be affected.

In summary, other natural and human-caused factors, such as the limited distribution of the three known natural populations and the effects of climate change (i.e., decreased rainfall, severe droughts, and shift in life zones), are current threats to *Mitracarpus polycladus*. The threats to the species will be exacerbated by the expected changes in climatic conditions by 2050. We expect the projected changes in habitat and microhabitat conditions of temperature and rainfall will have negative effects on *M. polycladus*. The ecology of *M. polycladus* appears closely linked to specific current climatic conditions of rain seasonality and drought periods. By 2050, sea level rise is expected to affect the Caribbean islands, including Puerto Rico, Anegada Island, and Saba Island. Overall, the effects of a changing climate on *M. polycladus* will be exacerbated by the relatively low number of populations and habitat degradation and fragmentation, which can affect the future viability of the species.

Conservation Efforts and Regulatory Mechanisms

In the final listing rule (59 FR 46715; September 9, 1994), we identified the inadequacy of existing regulatory mechanisms as one of the factors affecting the continued existence of *Mitracarpus polycladus*. Outside of the protections provided by the Act, the Commonwealth of Puerto Rico legally protects *M. polycladus* as an endangered species, including protections to its habitat, through Commonwealth Law No. 241-1999 (title 12 of the Laws of Puerto Rico at sections 107–107u) and Regulation 6766 (To govern the management of threatened and endangered species in the Commonwealth of Puerto Rico), which prohibit collecting, cutting,

and removal, among other actions, of listed plants (DRNA 2004, p. 11). These protections are described further in our June 23, 2022, proposed rule (87 FR 37476). Although there are legal mechanisms in place (e.g., laws or regulations) for the protection of *M. polycladus*, the enforcement of such mechanisms on private and public land is sometimes challenging. Land managers, landowners, and law enforcement officers are not always aware of the localities occupied by the species throughout its range or may have difficulty correctly identifying the plant (Service 2018b, p. 10). Therefore, limited public awareness of the species and its status exacerbates the challenge of implementation of existing laws and regulations and affects conservation of *M. polycladus* and its habitat.

On Anegada Island, various conservation and education efforts are taking place for the protection of rare plant and animal species (Gardner et al. 2008, entire; IRF 2013, p. 29). However, we are unaware of any formal regulatory mechanism that protects *Mitracarpus polycladus* on Anegada Island or Saba Island (Geelhoed et al. 2013, p. 12).

We do not expect this species to be removed from legal protection by the Commonwealth when it is reclassified as a threatened species under the Act. This plant is now more abundant, is widely distributed, and largely occurs within conserved lands. Despite the existing regulatory mechanisms and conservation efforts, the threats discussed above are still affecting the species to the extent that it does not meet the criteria for delisting. However, additional opportunities exist to engage the public and provide information about *M. polycladus* and support the enforcement of existing protective mechanisms.

Overall Summary of Factors Affecting the Species

We have carefully assessed the best scientific and commercial information available regarding the threats that are currently impacting and expected to impact *Mitracarpus polycladus* in developing this rule. Limited distribution and a low number of individuals were considered a threat to *M. polycladus* when we listed the species (59 FR 46715; September 9, 1994). Recent information indicates the species is more abundant and widely distributed than was known at the

time of listing, and most individuals occur in protected lands where threats are reduced, although threats are still present. We determined that habitat destruction and modification (e.g., vegetation clearance with trail and road maintenance activities, human-caused fires, encroachment by nonnative and invasive species, urbanization and tourism development, and grazing), as well as other natural or manmade factors such as limited distribution and the effects of climate change, will continue to pose threats to *M. polycladus* in the foreseeable future.

We evaluated the biological status of this species, both currently and into the future, considering the species' viability as characterized by its resiliency, redundancy, and representation. *Mitracarpus polycladus* has demonstrated some level of resiliency to natural and anthropogenic disturbances in the past. Adult individuals have overcome disturbances such as droughts and habitat modification, road and trail maintenance, and fires. However, seedlings are susceptible to the effects of drought and to the invasion of nonnative plant species after fire or other disturbance events. The lack of or reduced seedling recruitment affects population demographics and the long-term viability of the species.

For *Mitracarpus polycladus* to maintain viability, populations, or some portion thereof, must be sufficiently resilient. Resiliency describes the ability of a population to withstand stochastic events (arising random factors). We can measure resiliency based on metrics of population health: for example, birth versus death rates and population size. For this rule, our classification of resiliency relies heavily on the biology of the species and habitat characteristics in the absence of highly certain population size or trend estimates.

We broadly defined categories of resiliency for *Mitracarpus polycladus* populations by assessing demographic and habitat parameters and anchored these categories in the species' needs and life-history characteristics (see table 3, below). Important species' characteristics center on the species' seasonality, seedling mortality after drought, dispersal capability, and competition with nonnative grasses for space and resources. The demographic metrics we evaluated include abundance at localities and evidence of reproduction or recruitment. We

assessed habitat characteristics, including the degree of habitat protection (or, conversely, development risk), extent of suitable habitat, connectivity to other localities, and vulnerability to threats. A population may not exhibit each characteristic of the category as defined, but most parameters known for the population fall into the resilience category. For example, a population that is described as highly resilient may have high abundance, high number of localities, good distribution of localities, and recruitment at most localities even if suitable habitat and connectivity is limited.

Table 3. Definitions for *Mitracarpus polycladus* Population Resiliency Categories.

High	Moderate	Low
<ul style="list-style-type: none"> • Abundance is high; • Number of localities is high, and they occupy a greater spatial extent within suitable habitat; • Reproduction and recruitment are such that the population remains stable or increases; • Abundant suitable habitat occurs outside known localities; and • Connectivity occurs among most localities. 	<ul style="list-style-type: none"> • Abundance is moderate; • Number of localities is moderate, and they occupy a limited spatial extent within suitable habitat; • Reproduction and/or recruitment is occurring at some localities; • Recruitment and mortality are equal such that the population does not grow, or the population trend is unknown; • Some suitable habitat occurs outside known localities; and • Connectivity occurs between at least two localities. 	<ul style="list-style-type: none"> • Abundance is low; • Number of localities is limited to one, and it occupies a very restricted spatial extent; • No reproduction or recruitment is occurring; • Mortality exceeds recruitment such that the population is declining; • Limited or no suitable habitat occurs outside known locality; and • There is no connectivity between localities (single locality population).

Currently, three *Mitracarpus polycladus* natural populations are known from three islands in the Caribbean (i.e., Puerto Rico, Anegada Island, and Saba Island). In Puerto Rico, many *M. polycladus* adult individuals occur in small clusters, and seedlings have been documented, particularly after rain events. Information from Anegada Island and Saba Island is very limited, making it difficult to determine the level of population resiliency. However, both of those populations of *M. polycladus* demonstrate some level of resiliency as populations remain on the landscape on both islands and have presumably overcome historical disturbances of varying magnitude and duration, including habitat modification.

The short time it takes *Mitracarpus polycladus* to reach reproductive size and the extent of seed production facilitates population-level resiliency. However, resiliency is limited by the small size of clusters of individuals, species' seasonality, low dispersal capacity, and high seedling mortality. We have no evidence that known *M. polycladus* clusters are expanding or colonizing suitable habitat away from roads and trails. The lack of expansion and colonization results in isolated clusters with an increased chance of reduced genetic variation due to genetic drift, potentially resulting in inbreeding depression and lower resiliency. In addition, *M. polycladus* has been displaced by nonnative, invasive species after habitat disturbance by fire, which further precludes the effective recruitment of the species. The *M. polycladus* population in Puerto Rico occurs on 0.44 ha (1.1 ac) of habitat in 10 naturally occurring and 1 introduced locality. Suitable habitat connects some, but not all, localities. Increased connectivity between scattered localities in Puerto Rico is expected to improve population resiliency. The Saba and Anegada Islands populations occur in limited areas as well. We do not have information about the population trend and areal extent of these localities. Overall, the limited areal extent of *M. polycladus* contributes to its susceptibility to stochastic and catastrophic events. Based on these factors, we determined that the Puerto Rico population currently exhibits moderate resiliency while the Anegada and Saba Islands populations exhibit unknown or low resiliency.

The species' viability is also affected by its ability to adapt to changing environmental conditions. We have no information on the genetic variability of *Mitracarpus polycladus* nor information on variation in adaptive life-history traits, and, therefore, we evaluated the species' ability to adapt based on its likelihood of maintaining the breadth of genetic diversity and gene flow. This species occurs in small patches of suitable habitat within subtropical dry forest on three islands of the Caribbean with little variation in habitat conditions between populations. Historically, genetic diversity may have contributed to the species' ability to adapt to changing conditions, and the species likely has maintained underlying genetic diversity. Rangelwide, all

populations are vulnerable to the threats that could result in the extirpation of clusters of individuals or localities and the loss of genetic representation.

The ability of the species to adapt is also a function of the level of gene flow among populations. The three *Mitracarpus polycladus* populations are disconnected; thus, gene flow is limited to individuals within populations due to the lack of connectivity that would allow cross-pollination among populations. As described above in *Limited Distribution and Small Population Size*, small, isolated populations are susceptible to genetic effects; however, the best available information indicates that species viability is not affected by genetic issues at present. As fragmentation increases, gene flow will be reduced further, and the populations will become more vulnerable to genetic drift and inbreeding, thereby reducing the species' adaptive capacity. We determined *M. polycladus* representation is likely reduced from historical representation due to reduced or fragmented habitat conditions, but the species maintains moderate adaptive capacity.

Lastly, the species' viability depends on its ability to withstand catastrophic events, which is a function of the resiliency, number, and distribution of *Mitracarpus polycladus* populations. The more sufficiently resilient populations, and the wider the distribution of those populations, the more redundancy the species will exhibit. The primary catastrophic risks to *M. polycladus* include widespread, prolonged drought and fire. These threats are expected to increase in the future as the subtropical dry forest where the species occurs shifts to very dry forest habitat. The species' largest population (Puerto Rico) is moderately resilient and now occurs in a wider rangewide distribution than was known historically. We have determined *M. polycladus* currently exhibits moderate species redundancy.

In summary, the current abundance of *Mitracarpus polycladus* has increased and some of the identified threats have decreased since its listing in 1994. However, our analysis indicates that threats and stressors continue to affect the species. We based our analyses on biological

factors, expert judgment regarding the consequences of interacting stressors to the species' viability, and our assessment of likely future habitat conditions.

Determination of *Mitracarpus polycladus*'s Status

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations (50 CFR part 424) set forth the procedures for determining whether a species meets the definition of an endangered species or threatened species. The Act defines an "endangered species" as a species that is in danger of extinction throughout all or a significant portion of its range and a "threatened species" as a species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. The Act requires that we determine whether a species meets the definition of endangered species or threatened species based on one or more of the following factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence.

Status Throughout All of Its Range

After evaluating threats to the species and assessing the cumulative effect of the threats under the Act's section 4(a)(1) factors, we have determined that *Mitracarpus polycladus*'s current viability is higher than was known at the time of listing (current abundance estimate of more than 20,000 adult individuals in three populations) and most individuals occur on protected lands where threats are reduced. At the time of listing, the known range of *M. polycladus* consisted of an undetermined number of individuals located in a single population in southern Puerto Rico and from one record on Saba Island. The primary threats were habitat destruction and modification, inadequacy of existing regulatory mechanisms, and limited distribution (see 59 FR 46715, September 9, 1994, pp. 46716–46717). Currently, *M. polycladus* is known to occur in 11 localities within an areal extent of 0.44 ha (1.1 ac) in southern Puerto Rico and several

localities on Saba Island and Anegada Island. In Puerto Rico, about 89 percent of the known *M. polycladus* individuals occur within the GCF, a forest managed for conservation by the Department in a manner compatible with *M. polycladus*'s needs and protected by Commonwealth regulations.

The remaining 11 percent of individuals on Puerto Rico and individuals on Saba and Anegada Islands occur on private lands and are at risk due to habitat destruction and modification from wind farm projects, urbanization, and tourism development. Information from Puerto Rico also indicates that threats from human-caused fires, human trampling, and nonnative and invasive species impact *Mitracarpus polycladus* on both public and private lands. These threats may be more severe for the populations on private lands, since fire management prevention practices and other management actions implemented on public lands are not required on private lands. On Saba and Anegada Islands, the species also faces threats due to residential and commercial development and degradation due to grazing of feral livestock. Information from Anegada Island and Saba Island is very limited, making it difficult to determine the level of population resiliency; however, both populations demonstrate some level of resiliency as we have longstanding records from the same localities that have presumably overcome historical disturbances of varying magnitude and duration, including habitat modification. Thus, we determined the Puerto Rico population currently exhibits moderate resiliency and the resiliency of the Anegada and Saba Islands populations is unknown or low.

The species' distribution is wider than known at the time of listing, and the species' listing by the Commonwealth of Puerto Rico provides some level of protection to *Mitracarpus polycladus*. However, remaining threats are ongoing and projected to impact the species in the future. These include the present or threatened destruction, modification, or curtailment of its habitat or range (e.g., maintenance of existing roads and trails, human trampling, human-caused fires, encroachment of nonnative and invasive species after fires and other habitat modification activities, and urbanization and tourism development) (Factor A); and other natural or manmade

factors affecting the continued existence of *M. polycladus* throughout its range (e.g., limited distribution and the effects of climate change) (Factor E). The best available information does not indicate that overutilization or diseases are affecting the species or feral livestock are specifically targeting this species and consuming it. Despite the identification of these threats that currently, and are expected to continue to, impact the species, we conclude that the populations exhibit sufficient resiliency and species-level representation and redundancy.

In summary, *Mitracarpus polycladus* is distributed across a narrow range, but the number of localities within populations and environmental conditions have improved since the time of listing. Thus, after assessing the best available information, we conclude that *M. polycladus* is not in danger of extinction now throughout all of its range. We therefore proceed with determining whether *M. polycladus* is likely to become endangered within the foreseeable future throughout all of its range.

Based on biological factors and stressors to the species' viability, we determined 25 years to be the foreseeable future within which we can reasonably project threats and the species' response to those threats. The foreseeable future for the individual factors and threats varies. We reviewed available information including forest management plans, proposed development projects, and fire history within the range of the species, to inform our assessment of likely future levels for each threat. Projections for 2050 predict increases in temperature and decreases in precipitation (Khalyani et al. 2016, pp. 274–275). However, divergence in temperature and precipitation projections increase dramatically after mid-century among climate change scenarios, making late-century projections more uncertain and reducing our ability to reliably predict stressors associated with climate change (Khalyani et al. 2016, p. 275). In addition, observation of threats and the effects of those threats on the species since it was listed in 1994 (more than 25 years ago) have given us a baseline to understand how threats may impact the species. We have observed the effects of habitat destruction and modification (such as vegetation clearance for maintaining or improving trails and access roads, human trampling, human-caused

fires, invasive species, and urban and tourist development) and climate change (predicted changes in temperature, increased droughts, and life zones shifting) on the species since its listing and incorporated these observations to reliably predict the species' response to these threats.

The 25-year period includes multiple generations of the species and allowed adequate time for impacts from conservation efforts or changes in threats to be observed through population responses. This timeframe accounts for the species' reproductive biology, and thus the time required by multiple generations of *Mitracarpus polycladus* to reach a reproductive size and effectively contribute to the viability of the species. It accounts for reaching maturity, flowering, setting viable fruits and seeds, seed germination, and seedling survival and establishment, and it allows environmental stochastic events such as severe drought periods to affect the species. Furthermore, the established timeframe provides an opportunity to analyze the implications of the Department's forest management actions, and existing laws and regulations to protect currently known populations.

Although population numbers and abundance of *Mitracarpus polycladus* have increased and the species' occurrences appear stable, threats remain in magnitude, scope, and impact over time. Habitat destruction and modification, such as vegetation clearance for maintaining or improving trails and access roads, human trampling, human-caused fires, invasive species, and urban and tourist development (Factor A), and other natural or manmade factors such as the effects of climate change (Factor E) may limit the species' abundance and distribution of occurrences. Gene flow will continue to be limited to individuals within populations due to the lack of connectivity that would allow cross-pollination among populations; populations may become more vulnerable to genetic drift and inbreeding, thereby reducing the species' ability to adapt to changing conditions. Although much of the Puerto Rico population occurs in the GCF, which is managed for conservation, actions that benefit the species will not eliminate the threats of trail maintenance, trampling, nonnative and invasive species, and human-caused fires, and

these threats are expected to continue to affect the species in the foreseeable future. Proposed urbanization and tourism development projects may be completed in the foreseeable future. Furthermore, under climate change projections, the risk of catastrophic drought and fire is expected to increase with the subtropical dry forest shifting to very dry forest habitat within the foreseeable future.

The magnitude of effects associated with habitat destruction and modification along with climate change are expected to continue and potentially increase in the foreseeable future. Despite the existing regulatory mechanisms and conservation efforts, the threats discussed above are still affecting the species to the extent that it does not meet the criteria for delisting. Thus, after assessing the best available information, we conclude that *M. polycladus* is not currently in danger of extinction, but is likely to become in danger of extinction within the foreseeable future throughout all of its range.

Status Throughout a Significant Portion of Its Range

Under the Act and our implementing regulations, a species may warrant listing if it is in danger of extinction or likely to become so in the foreseeable future throughout all or a significant portion of its range. The court in *Center for Biological Diversity v. Everson*, 435 F. Supp. 3d 69 (D.D.C. 2020) (*Everson*), vacated the provision of the Final Policy on Interpretation of the Phrase “Significant Portion of Its Range” in the Endangered Species Act’s Definitions of “Endangered Species” and “Threatened Species” (hereafter “Final Policy”; 79 FR 37578; July 1, 2014) that provided that if the Service determines that a species is threatened throughout all of its range, the Service will not analyze whether a species is endangered in a significant portion of its range.

Therefore, we proceed to evaluating whether the species is endangered in a significant portion of its range—that is, whether there is any portion of the species’ range for which both (1) the portion is significant, and (2) the species is in danger of extinction in that portion. Depending on the case, it might be more efficient for us to address the “significance” question or the

“status” question first. We can choose to address either first. Regardless of which question we address first, if we reach a negative answer with respect to the first question that we address, we do not need to evaluate the other question for that portion of the species’ range.

Following the court’s holding in *Everson*, we now consider whether there are any significant portions of the species’ range where the species is in danger of extinction now (i.e., endangered). In undertaking this analysis for *Mitracarpus polycladus*, we choose to address the status question first by considering information pertaining to the geographic distribution of both the species and the threats that the species faces to determine whether there are any portions of the range where the species is endangered.

We evaluated the range of *Mitracarpus polycladus* to determine if the species is in danger of extinction now in any portion of its range. The range of a species can theoretically be divided into portions in an infinite number of ways. We focused our analysis on portions of the species’ range that may meet the Act’s definition of an endangered species. For *M. polycladus*, we considered whether the threats or their effects on the species are greater in any biologically meaningful portion of the species’ range than in other portions such that the species is now in danger of extinction in that portion.

We examined the following threats: habitat loss and modification due to vegetation maintenance or trimming along roads and trails, human trampling, and urbanization and tourism development; human-caused fires; nonnative, invasive plant species; and the effects of climate change (prolonged droughts, expected shifts of life zones, and sea level rise), including cumulative effects. We also considered whether these threats may be exacerbated by small population size and limited connectivity between populations. For detailed description of each threat, see **Summary of Biological Status and Threats**, above.

Habitat modification poses a threat to most of the 11 *Mitracarpus polycladus* localities in Puerto Rico, as well as the populations on Saba and Anegada Islands. The *M. polycladus* populations on Puerto Rico, Anegada Island, and Saba Island experience threats of habitat

degradation and modification due to vegetation clearance for maintenance and improvement of roads and trails, urbanization and tourism development, human-caused fires, and the subsequent encroachment of nonnative and invasive species. In addition, approximately 11 percent of *M. polycladus* individuals in Puerto Rico occur on private lands that are exposed to the threat of development more so than individuals on protected lands. Moreover, the species' localities in each population are distributed across a limited geographic area. Although climate change is expected to affect *M. polycladus* populations in the foreseeable future, we determined that climate change does not represent a current threat to the species; therefore, our assessment of the threat of climate change as a future threat is consistent with our "threatened" status determination for the species.

Small population size can exacerbate other threats on the species. The information regarding *Mitracarpus polycladus* populations on Anegada and Saba Islands is more limited than that regarding the Puerto Rico population. Based on the best available information for Anegada and Saba Islands, these populations are currently small or assumed to be small (2,500 on Anegada Island and unknown abundance on Saba Island) and in a few localities with limited distribution. Ten of the 11 species' localities on Puerto Rico also occur in clusters with low numbers of individuals that are isolated from other clusters, but the species is represented by a wider distribution on Puerto Rico than on Anegada and Saba Islands. Despite the rarity of *M. polycladus* on Anegada and Saba Islands, the species has demonstrated continued presence for decades in some localities. Although species' persistence does not equate with high resiliency or viability of a population or species, we expect *M. polycladus* populations to maintain resiliency in the future, despite ongoing threats. Therefore, small population size and low abundance in these localities, even when considered in the context of other threats, do not represent a concentration of threats at a biologically meaningful scale such that the species may be in danger of extinction in this portion. Based on our review of information and the synergistic effects of

threats on Anegada and Saba Islands, this portion of the species' range does not provide a basis for determining that the species is in danger of extinction in a significant portion of its range.

Overall, we found that threats likely are impacting individuals or populations similarly across the species' range. Kinds of threats and levels of threats are more likely to vary across a species' range if the species has a large range rather than a very small natural range, such as *M. polycladus*. Species with limited ranges are more likely to experience the same types and generally the same levels of threats in all parts of their range. These threats are certain to occur, and populations are facing the same extent of threats, even though certain populations may have fewer occurrences.

We found no portion of *Mitracarpus polycladus*'s range where threats are impacting individuals differently than elsewhere in its range to the extent that the status of the species in one portion differs from any other portion of its range.

Therefore, no portion of the species' range provides a basis for determining that the species is in danger of extinction in a significant portion of its range, and we determine that the species is likely to become in danger of extinction within the foreseeable future throughout all of its range. This does not conflict with the courts' holdings in *Desert Survivors v. U.S. Department of the Interior*, 321 F. Supp. 3d 1011, 1070-74 (N.D. Cal. 2018) and *Center for Biological Diversity v. Jewell*, 248 F. Supp. 3d 946, 959 (D. Ariz. 2017) because, in reaching this conclusion, we did not need apply the aspects of the Final Policy, including the definition of "significant," that those court decisions held were invalid.

Determination of Status

Our review of the best available scientific and commercial information indicates that *Mitracarpus polycladus* meets the Act's definition of a threatened species. Therefore, we are reclassifying *M. polycladus* as a threatened species in accordance with sections 3(20) and 4(a)(1) of the Act.

II. Final Rule Issued Under Section 4(d) of the Act

Under section 4(d) of the Act, the Secretary may promulgate protective regulations for threatened species. Because we are reclassifying this species as a threatened species, the prohibitions in section 9 will not apply directly. We are, therefore, promulgating below a set of regulations to provide for the conservation of the species in accordance with the Act's section 4(d), which also authorizes us to apply any of the prohibitions in section 9 to a threatened species. The discussion below regarding protective regulations under section 4(d) of the Act complies with our policy, as published in the *Federal Register* on July 1, 1995 (59 FR 34272), to identify to the maximum extent practical at the time a species is listed, those activities that would or would not constitute a violation of section 9 of the Act.

Background

Section 4(d) of the Act contains two sentences. The first sentence states that the Secretary shall issue such regulations as she deems necessary and advisable to provide for the conservation of species listed as "threatened." The U.S. Supreme Court has noted that statutory language similar to the language in section 4(d) of the Act authorizing the Secretary to take action that she "deems necessary and advisable" affords a large degree of deference to the agency (see *Webster v. Doe*, 486 U.S. 592 (1988)). Conservation is defined in the Act to mean the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to the Act are no longer necessary. Additionally, the second sentence of section 4(d) of the Act states that the Secretary may by regulation prohibit with respect to any threatened species any act prohibited under section 9(a)(1), in the case of fish or wildlife, or section 9(a)(2), in the case of plants. Thus, the combination of the two sentences of section 4(d) provides the Secretary with wide latitude of discretion to select and promulgate appropriate regulations tailored to the specific conservation needs of a threatened species. The second sentence grants particularly broad discretion to us when adopting prohibitions under section 9.

The courts have recognized the extent of the Secretary's discretion under this standard to develop rules that are appropriate for the conservation of a species. For example, courts have upheld, as a valid exercise of agency authority, rules developed under section 4(d) that included limited prohibition against takings (see *Alsea Valley Alliance v. Lautenbacher*, 2007 WL 2344927 (D. Or. 2007); *Washington Environmental Council v. National Marine Fisheries Service*, 2002 WL 511479 (W.D. Wash. 2002)). Courts have also upheld 4(d) rules that do not address all of the threats a species faces (see *State of Louisiana v. Verity*, 853 F.2d 322 (5th Cir. 1988)). As noted in the legislative history when the Act was initially enacted, "once an animal is on the threatened list, the Secretary has an almost infinite number of options available to [her] with regard to the permitted activities for those species. [She] may, for example, permit taking, but not importation of such species, or [she] may choose to forbid both taking and importation but allow the transportation of such species" (H.R. Rep. No. 412, 93rd Cong., 1st Sess. 1973).

The provisions of this 4(d) rule promote conservation of *Mitracarpus polycladus* by encouraging management of the habitat in ways that facilitate conservation for the species. The provisions of this rule are one of many tools that we use to promote the conservation of *M. polycladus*. As explained below, we are adopting a species-specific rule that sets out all of the protections and prohibitions applicable to *M. polycladus*.

Section 7(a)(2) of the Act requires Federal agencies, including the Service, to ensure that any action they fund, authorize, or carry out is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of designated critical habitat of such species.

If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency (action agency) must enter into consultation with us. Examples of actions that are subject to the section 7 consultation process are actions on State, Tribal, local, or private lands that require a Federal permit (such as a permit from the U.S. Army Corps of Engineers under section 404 of the Clean Water Act (33 U.S.C. 1251 *et seq.*) or a permit from the Service under

section 10 of the Act) or that involve some other Federal action (such as funding from the Federal Highway Administration, Federal Aviation Administration, or the Federal Emergency Management Agency). Federal actions not affecting listed species or critical habitat—and actions on State, Tribal, local, or private lands that are not federally funded, authorized, or carried out by a Federal agency—do not require section 7 consultation.

These requirements are the same for a threatened species with a species-specific 4(d) rule. For example, as with an endangered species, if a Federal agency determines that an action is “not likely to adversely affect” a threatened species, the action will require formal consultation and the formulation of a biological opinion (50 CFR 402.14(a)).

Provisions of the 4(d) Rule

Exercising the Secretary’s authority under section 4(d) of the Act, we have developed a species-specific rule that is designed to address *Mitracarpus polycladus*’s conservation needs. As discussed previously in **Summary of Biological Status and Threats**, we have concluded that *Mitracarpus polycladus* is likely to become in danger of extinction within the foreseeable future primarily due to the present or threatened destruction, modification, or curtailment of its habitat or range (specifically, road and trail maintenance, human-caused fires, nonnative and invasive species, urbanization and tourism development; and grazing); and other natural or manmade factors (specifically, the effects of climate change). Section 4(d) requires the Secretary to issue such regulations as she deems necessary and advisable to provide for the conservation of each threatened species and authorizes the Secretary to include among those protective regulations any of the prohibitions that section 9(a)(2) of the Act prescribes for endangered species. We find that the protections, prohibitions, and exceptions in this species-specific rule as a whole satisfy the requirement in section 4(d) of the Act to issue regulations deemed necessary and advisable to provide for the conservation of *M. polycladus*.

The protective regulations we are finalizing for *Mitracarpus polycladus* incorporate prohibitions from section 9(a)(2) of the Act to address threats to the species. Section 9(a)(2)

prohibits the following activities for endangered plants: importing or exporting; certain acts related to removing, damaging, and destroying; delivering, receiving, carrying, transporting, or shipping in interstate or foreign commerce in the course of commercial activity; or selling or offering for sale in interstate or foreign commerce. These protective regulations include all of these prohibitions for *M. polycladus* because the species is at risk of extinction within the foreseeable future and putting these prohibitions in place will help to protect the species' existing populations, slow its rate of decline, and decrease synergistic, negative effects from other threats.

The exceptions to the prohibitions include all of the general exceptions to the prohibitions for endangered plants against removing and reducing to possession, as set forth at 50 CFR 17.61(c), and certain other specific activities that we except, as described below. Despite these prohibitions regarding threatened species, we may under certain circumstances issue permits to carry out one or more otherwise-prohibited activities, including those described above. The regulations that govern permits for threatened plants state that the Director may issue a permit authorizing any activity otherwise prohibited with regard to threatened species (50 CFR 17.72). Those regulations also state that the permit shall be governed by the provisions of § 17.72 unless a special rule applicable to the plant is provided in §§ 17.73 to 17.78. Therefore, permits for threatened species are governed by the provisions of § 17.72 unless a species-specific 4(d) rule provides otherwise. However, under our recent revisions to § 17.71, the prohibitions in § 17.71(a) do not apply to any plant listed as a threatened species after September 26, 2019. As a result, for threatened plant species listed after that date, any protections must be contained in a species-specific 4(d) rule. We did not intend for those revisions to limit or alter the applicability of the permitting provisions in § 17.72, or to require that every species-specific 4(d) rule spell out any permitting provisions that apply to that species and species-specific 4(d) rule. To the contrary, we anticipate that permitting provisions will generally be similar or identical for most species, so applying the provisions of § 17.72 unless a species-specific 4(d) rule provides otherwise will likely avoid substantial duplication. Under 50 CFR 17.72 with regard to

threatened plants, a permit may be issued for the following purposes: For scientific purposes, to enhance propagation or survival, for economic hardship, for botanical or horticultural exhibition, for educational purposes, or for other activities consistent with the purposes and policy of the Act. Additional statutory exceptions from the prohibitions are found in sections 9 and 10 of the Act.

We recognize the beneficial and educational aspects of activities with seeds of cultivated plants, which generally enhance the propagation of the species and, therefore, will satisfy permit requirements under the Act. We intend to monitor the interstate and foreign commerce and import and export of these specimens in a manner that will not inhibit such activities, providing the activities do not represent a threat to the species' survival in the wild. In this regard, seeds of cultivated specimens will not be subject to the prohibitions above, provided that a statement that the seeds are of "cultivated origin" accompanies the seeds or their container (e.g., the seeds could be moved across State lines or between territories for purposes of seed banking or use for outplanting without additional regulations) (50 CFR 17.71(a)).

We recognize the special and unique relationship with our State and Territorial natural resource agency partners in contributing to conservation of listed species. State and Territorial agencies often possess scientific data and valuable expertise on the status and distribution of endangered, threatened, and candidate species of wildlife and plants. State and Territorial agencies, because of their authorities and their close working relationships with local governments and landowners, are in a unique position to assist us in implementing all aspects of the Act. In this regard, section 6 of the Act provides that we must cooperate to the maximum extent practicable with the States and Territories in carrying out programs authorized by the Act. Therefore, any qualified employee or agent of a State or Territorial conservation agency that is a party to a cooperative agreement with the Service in accordance with section 6(c) of the Act, who is designated by his or her agency for such purposes, will be able to conduct activities

designed to conserve *Mitracarpus polycladus* that may result in otherwise prohibited activities without additional authorization.

Nothing in this 4(d) rule will change in any way the recovery planning provisions of section 4(f) of the Act, the consultation requirements under section 7 of the Act, or our ability to enter into partnerships for the management and protection of *Mitracarpus polycladus*. However, interagency cooperation may be further streamlined through planned programmatic consultations for the species between Federal agencies and the Service.

Required Determinations

National Environmental Policy Act (42 U.S.C. 4321 et seq.)

Regulations adopted pursuant to section 4(a) of the Act are exempt from the National Environmental Policy Act (NEPA; 42 U.S.C. 4321 *et seq.*) and do not require an environmental analysis under NEPA. We published a notice outlining our reasons for this determination in the *Federal Register* on October 25, 1983 (48 FR 49244). This includes listing, delisting, and reclassification rules, as well as critical habitat designations and species-specific protective regulations promulgated concurrently with a decision to list or reclassify a species as threatened. The courts have upheld this position (e.g., *Douglas County v. Babbitt*, 48 F.3d 1495 (9th Cir. 1995) (critical habitat); *Center for Biological Diversity v. U.S. Fish and Wildlife Service*, 2005 WL 2000928 (N.D. Cal. Aug. 19, 2005) (concurrent 4(d) rule)).

Government-to-Government Relationship with Tribes

In accordance with the President's memorandum of April 29, 1994 (Government-to-Government Relations with Native American Tribal Governments; 59 FR 22951), Executive Order 13175 (Consultation and Coordination with Indian Tribal Governments), and the Department of the Interior's manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with federally recognized Tribes on a government-to-government basis. In accordance with Secretary's Order 3206 of June 5, 1997 (American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act), we readily

acknowledge our responsibilities to work directly with Tribes in developing programs for healthy ecosystems, to acknowledge that Tribal lands are not subject to the same controls as Federal public lands, to remain sensitive to Indian culture, and to make information available to Tribes. There are no federally recognized Tribes in the range of *Mitracarpus polycladus*.

References Cited

A complete list of references cited in this rulemaking is available on the internet at <https://www.regulations.gov> and upon request from the Caribbean Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Authors

The primary authors of this final rule are the staff members of the Caribbean Ecological Services Field Office.

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Plants, Reporting and recordkeeping requirements, Transportation, Wildlife.

Regulation Promulgation

Accordingly, we hereby amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS

1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361–1407; 1531–1544; and 4201–4245, unless otherwise noted.

2. In § 17.12, in paragraph (h), amend the List of Endangered and Threatened Plants by revising the entry for “*Mitracarpus polycladus*” under FLOWERING PLANTS to read as follows:

§ 17.12 Endangered and threatened plants.

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(h) * * *

Scientific name	Common name	Where listed	Status	Listing citations and applicable rules
FLOWERING PLANTS				
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<i>Mitracarpus polycladus</i>	No common name	Wherever found	T	59 FR 46715, 9/9/1994; 88 FR [INSERT <i>FEDERAL REGISTER</i> PAGE WHERE THE DOCUMENT BEGINS], [INSERT DATE OF PUBLICATION IN THE <i>FEDERAL REGISTER</i>]; 50 CFR 17.73(i). ^{4d}
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3. Amend § 17.73 by adding paragraph (i) to read as follows:

§ 17.73 Special rules—flowering plants.

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(i) *Mitracarpus polycladus* (no common name).

(1) *Prohibitions.* The following prohibitions that apply to endangered plants also apply to *Mitracarpus polycladus*. Except as provided under paragraph (i)(2) of this section, it is unlawful for any person subject to the jurisdiction of the United States to commit, to attempt to commit, to solicit another to commit, or cause to be committed, any of the following acts in regard to this species:

(i) Import or export, as set forth at § 17.61(b) for endangered plants.

(ii) Remove and reduce to possession the species from areas under Federal jurisdiction; maliciously damage or destroy the species on any such area; or remove, cut, dig up, or damage or destroy the species on any other area in knowing violation of any law or regulation of the Territory or in the course of any violation of a Territorial criminal trespass law.

(iii) Interstate or foreign commerce in the course of commercial activity, as set forth at § 17.61(d) for endangered plants.

(iv) Sale or offer for sale, as set forth at § 17.61(e) for endangered plants.

(2) *Exceptions from prohibitions.* In regard to this species, you may:

(i) Conduct activities as authorized by permit under § 17.72.

(ii) Remove, cut, dig up, damage, or destroy on areas not under Federal jurisdiction if you are a qualified employee or agent of the Service or Territorial conservation agency which is a party to a cooperative agreement with the Service in accordance with section 6(c) of the Act, and you have been designated by that agency for such purposes, when acting in the course of official duties.

(iii)(A) Any employee or agent of the Service, any other Federal land management agency, or a Territorial conservation agency, who is designated by that agency for such purposes, may, when acting in the course of official duties, remove and reduce to possession *Mitracarpus polycladus* from areas under Federal jurisdiction without a permit if such action is necessary to:

- (1) Care for a damaged or diseased specimen;
- (2) Dispose of a dead specimen; or
- (3) Salvage a dead specimen which may be useful for scientific study.

(B) Any removal and reduction to possession pursuant to this paragraph must be reported in writing to the U.S. Fish and Wildlife Service within 5 days. The specimen may only be retained, disposed of, or salvaged in accordance with written directions from the Service.

(iv) Engage in any act prohibited under paragraph (i)(1) of this section with seeds of cultivated specimens, provided that a statement that the seeds are of “cultivated origin” accompanies the seeds or their container.

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Martha Williams,
Director,
U.S. Fish and Wildlife Service.