

[Recovery Plan for *Leptocereus grantianus* \(no common name\)](#)

Original Approved: July 26, 1995

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DRAFT AMENDMENT 1

We have identified best available information that indicates the need to amend recovery criteria for the cacti *Leptocereus grantianus* since the recovery plan was completed. In this proposed modification, we synthesize the adequacy of the existing recovery criteria; show amended recovery criteria, and the rationale supporting the proposed recovery plan modification. The proposed modification will be shown as an addendum that supplements the recovery plan (USFWS 1995), superseding only Part II A page 5 of the recovery plan. Recovery plans are a non-regulatory document that provides guidance on how best to help recover the species.

**For
U.S. Fish and Wildlife Service
Caribbean Ecological Service Field Office, Region 4
Boquerón, Puerto Rico**

September 2018

[Insert Signature Lines (for final modification)]

METHODOLOGY USED TO COMPLETE THE RECOVERY PLAN AMENDMENT

The proposed amendments to the recovery criteria are based on recent studies with the species and the information contained in the 2015 5-year review (USFWS 2015). These were developed by U.S. Fish and Wildlife Service (Service) biologists and managers in the Caribbean Ecological Services Field Office (CESFO).

ADEQUACY OF RECOVERY CRITERIA

Section 4(f)(1)(B)(ii) of the Endangered Species Act (Act) requires that each recovery plan shall incorporate, to the maximum extent practicable, “objective, measurable criteria which, when met, would result in a determination...that the species be removed from the list.” Legal challenges to recovery plans (see *Fund for Animals v. Babbitt*, 903 F. Supp. 96 (D.D.C. 1995)) and a Government Accountability Audit (GAO 2006) also have affirmed the need to frame recovery criteria in terms of threats assessed under the five listing factors.

Recovery Criteria

See previous version of criteria in [Recovery Plan for *Leptocereus grantianus*](#) on page 5.

Synthesis

When the recovery plan for *L. grantianus* was signed in 1995, the species was known to occur only in one (1) locality on the Island of Culebra, with an estimated population of 50 individuals (USFWS 1995). The Island of Culebra is a municipality located approximately 20 miles (30 kilometers (km)) east of Puerto Rico, and is part of an archipelago that includes 23 smaller uninhabited offshore cays. *L. grantianus* is still known to occur only on Culebra Island, but the species' abundance is now estimated at around 261 individuals in six (6) localities within three (3) main populations: 191 individuals in three localities within Villas Mi Terruño; 20 individuals in Playa Melones; and 50 individual in two sites within Punta Soldado (USFWS 2015). Of these sites, the three sites within Villas Mi Terruño and one site in Punta Soldado are on private lands. One of the sites within Punta Soldado is located within the natural reserve managed by the Puerto Rico Department of Natural and Environmental Resources (PRDNER). The individuals at Playa Melones are located within the maritime zone also managed by the PRDNER.

From 1996 to 2013, the Service produced over 360 individuals of *L. grantianus* from cuttings in tree nursery conditions, and has planted 193 of them in seven sites on private property with a landowner's conservation agreement and within the Culebra Island National Wildlife Refuge (CINWR) (e.g. Flamenco peninsula, Luis Peña Island, Culebrita Island). In 2013, the Service conducted a rapid assessment of the introduced population of *L. grantianus* and visited all planted individuals. Less than 5% had survived due to anthropogenic factors (i.e., intentional fires) and predation by exotic mammals (i.e., deer and goats) (R. Colón-Merced and C. Pacheco, Service unpubl. data, 2014; USFWS 2015).

Recently, additional propagation and introduction efforts have been implemented on Culebra in partnership with Villa Mi Terruño and CINWR. Since 2011, the Service and Fundación Mi Terruño, Inc. signed a Cooperative Agreement (F12AC01199) under the Coastal and Partners for Fish and Wildlife Programs, to conduct joint efforts for the recovery of the three populations currently located within Villas Mi Terruño private land (USFWS 2015). Since the recovery plan was approved, five new populations of this species have been discovered on Culebra. Additionally, *L. grantianus* has been successfully propagated by cuttings and introduced in seven protected sites managed for conservation on the island (USFWS 2015). Propagation efforts have resulted in the following new populations within protected areas: 60 individuals in two new sites within Villa Mi Terruño property, 20 individuals in two new patches within Punta Soldado natural reserve, 25 individuals within Punta Flamenco, 20 individuals within Resaca beach, 3 individuals within the Observation Point, and 2 individuals within Culebrita Island.

Leptocereus grantianus is currently threatened by Factor A (present or threatened destruction, modification, or curtailment of its habitat or range), Factor C (disease and predation) and Factor E (other natural or manmade factors affecting its continued existence). At this time, habitat modification for development is still considered a threat for the species. Additionally, the Service documented habitat modification and degradation caused by small herbivorous animals such as goats and deer. Human-induced fires, physical damage caused by human trampling,

hurricanes and storms also are considered threats to this species. Furthermore, disease and predation are now considered threats to *L. grantianus* (USFWS 2015). A new pest affecting *Leptocereus* has been identified. Different species of columnar cacti in Puerto Rico are being affected by the *Harrisia* cactus mealybug (*Hypogecoccus pungens*). Although the pest is not known to occur on Culebra Island, infestation has been observed on individuals of *L. grantianus* planted in the Cabo Rojo National Wildlife Refuge. The effect of the mealybug on *L. grantianus* is not well understood because some of the infected individuals in the plant nursery appear to tolerate dense infestation, and some others died by a combination of factors (e.g., humidity, soil, transplanting stress, etc.), not only by the effects of the infestation (C. Pacheco, Service pers. obs. 2014). Currently, there is no information about how this new pest may affect the natural populations on Culebra. However, based on field observations on other cactus species, we believe that the establishment of this pest on Culebra may jeopardize the continued existence of *L. grantianus* within its natural range.

AMENDED RECOVERY CRITERIA

Recovery criteria serve as objective, measurable guidelines to assist in determining when an endangered species has recovered to the point that it may be downlisted to threatened, or that the protections afforded by the Act are no longer necessary and *L. grantianus* may be delisted. Delisting is the removal of a species from the Federal Lists of Endangered and Threatened Wildlife and Plants. Downlisting is the reclassification of a species from endangered to threatened. The term “endangered species” means any species (species, sub-species, or DPS) which is in danger of extinction throughout all or a significant portion of its range. The term “threatened species” means any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

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

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

We provide new delisting criteria for *L. grantianus*, which will supersede those included in the Recovery Plan. The recovery criteria presented below represent our best assessment of the

conditions that would most likely result in a determination that delisting of *L. grantianus* is warranted as the outcome of a formal five-factor analysis in a subsequent regulatory rulemaking. Achieving the prescribed recovery criteria is an indication that the species is no longer threatened or endangered, but this must be confirmed by a thorough analysis of the five factors.

Amended Delisting Recovery Criteria:

The amended delisting criteria for *L. grantianus* are as follows:

1. Existing three (3) populations on Culebra show a stable or increasing trend, evidenced by natural recruitment and multiple age classes (addresses Factor A and E).
2. Establish two (2) additional populations on Culebra offshore cays with a stable or increasing trend, evidenced by natural recruitment and multiple age classes (addresses Factor C and E).
3. Threat reduction and management activities (e.g. eradication and control of invasive predators) have been implemented to a degree that the species is viable (addresses Factor C).

Rationale for Recovery Criteria

We have amended the recovery criteria for *L. grantianus* to include delisting criteria that incorporate the biodiversity principles of representation, resiliency, and redundancy (Schaffer and Stein 2000) and current threats to the species. When *L. grantianus* was listed in 1993, the Service identified Factor A (the destruction of habitat due to agricultural activities and urban development) as one of the most significant threats to the species (58 FR 11550; USFWS 1995). Deforestation for urban development and agriculture practices has resulted in habitat degradation through fragmentation, soil erosion, and changes in forest structure on Culebra Island (USFWS 1995; C. Pacheco, Service, pers. obs., 2013). Currently, about 216 (82%) of the known natural adult individuals of *L. grantianus* occur on private lands subjected to residential and tourism development. Although a landowner's agreement is currently in place in one of the private properties, long-term protection of these populations is not secured. We believe that urban and tourism development and vegetation clearing still poses a threat to the species.

At present, the species is also threatened by Factor C (disease or predation) since it is vulnerable to infestation by the *Harrisia* cactus mealybug. Exotic mammals such as white-tailed deer (*Odocoileus virginianus*) and feral goats (*Capra aegagrus hircus*) are found throughout the range of the species on Culebra (C. Pacheco, Service pers. obs., 2013). It is expected that, due to their abundance, the exotic mammals are modifying the forest structure through overgrazing or altered habitat conditions by trampling. This may change microhabitat conditions that are necessary for seed germination and seedling recruitment of the species. Factor E (other natural or manmade factors) include human induced fires, over 115 planted individuals were lost by human induced fires in 2009 and 2010. Also included in this category is the species limited range and distribution.

The criteria presented are based on the reduction of threats, consistent with the current recovery strategy outlined in the recovery plan. Management and protection of existing populations is

needed to ensure existing populations show stable or increasing trends, evidenced by natural recruitment and multiple age classes. These measures include the development of long-term conservation mechanisms in privately-owned lands, habitat management practices, prevention of human-induced fires, and propagation and planting of individuals to augment existing populations to ensure viability. Also, establishing two additional self-sustaining populations on Culebra NWR offshore cays would address Factors A, C and E; and would increase species resilience and redundancy. Utilizing propagules from each population for propagation and planting would help increase representation. Planting individuals on Culebra NWR is dependent on Refuge staff eliminating introduced herbivores such as goats, sheep and deer from the Refuge cays. Once these invasive herbivore species are eliminated, cacti can be safely transplanted onto suitable substrate without risk of predation.

ADDITIONAL SITE SPECIFIC RECOVERY ACTIONS.

Develop and implement monitoring protocols to ensure that the cactus mealy bug does not pose a threat to unaffected *L. grantianus* populations. This recovery action will be coordinated with PRDNER, APHIS, and the Service's National Wildlife Refuge System.

LITERATURE CITED

C. Pacheco. 2010. Introduction of *Leptocereus grantianus* Britton "Cactaceae" in Punta Flamenco, Culebra. Unpublished data. Administrative file of *Leptocereus grantianus*. USFWS, Caribbean Ecological Services Field Office, Boquerón, Puerto Rico. 4 pp.

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