U. S. Fish and Wildlife Service

Recovery Plan
for the
Coquí llanero (*Eleutherodactylus juanariveroi*)

Photo by: C. Pacheco, USFWS

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DISCLAIMER

Recovery plans delineate reasonable actions that are believed necessary to recover and/or protect the species. Plans are prepared by the U.S. Fish and Wildlife Service, sometimes with the assistance of recovery teams, contractors, State agencies, and others. Plans are reviewed by the public and subject to additional peer review before they are adopted by the U.S. Fish and Wildlife Service. Objectives will only be attained and funds expended contingent upon appropriations, priorities, and other budgetary constraints. Recovery plans do not obligate other parties to undertake specific tasks. Recovery plans do not necessarily represent the views nor the official positions or approval of any individuals or agencies involved in the plan formulation, other than the U.S. Fish and Wildlife Service. They represent the official position of the U.S. Fish and Wildlife Service only after they have been signed by the Regional Director or Director as approved. Approved recovery plans are subject to modification as dictated by new findings, changes in species status, and the completion of recovery tasks. By approving this document, the Regional Director certifies that the information used in its development represents the best scientific and commercial data available at the time it was written. Copies of all documents reviewed in development of the plan are available in the administrative record, located at the U.S. Fish and Wildlife Service's Caribbean Ecological Services Field Office, Boquerón, Puerto Rico.

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Recovery Plan for

Coquí llanero (*Eleutherodactylus juanariveroi*)

This Recovery Plan describes criteria for determining when the coquí llanero should be considered for delisting from the Federal List of Endangered and Threatened Wildlife. It also lists site-specific actions that will be necessary to meet those criteria, and estimates the time and cost for implementing recovery actions. Additionally, cursory information on the species' biology and status are included, along with a brief discussion of factors limiting its population. A Species Biological Report, which provides a more detailed account of the species status, distribution, biology, and threats, and a Recovery Implementation Strategy, which describes the activities to implement the recovery actions, are available separately at http://www.fws.gov/caribbean/es. The Recovery Implementation Strategy and Species Biological Report are finalized separately from the Recovery Plan and will be updated on a routine basis.

CURRENT SPECIES' STATUS: The coquí llanero is a small frog endemic to Puerto Rico. In 2007, it was described as a new species of the genus *Eleutherodactylus*, family Leptodactylidae. Males measure approximately 0.58 in (14.7 mm), and females 0.62 in (15.8 mm). It has the smallest clutch size of all *Eleutherodactylus* species on the Island, and a high frequency call. Surveys indicate a mean population density of 473.3 ± 186 individuals per ha (or 192 per ac; Ríos-López pers. comm. 2011). In October 4, 2012, the coquí llanero was federally listed as an endangered species with a designation of 615 ac (249 ha) of critical habitat (77 FR 60778).

HABITAT REQUIREMENTS AND LIMITING FACTORS: The coquí llanero is currently known to be restricted to one freshwater herbaceous wetland in the municipality of Toa Baja, Puerto Rico. The herbaceous vegetation in the wetland consists of *Blechnum serrulatum* (toothed midsorus fern), *Thelypteris interrupta* (willdenow's maiden fern), *Sagittaria lancifolia* (bulltongue arrowhead), *Cyperus* sp. (flatsedges), *Eleocharis* sp. (spike rushes), and vines and grasses (Ríos-López and Thomas 2007). The species is currently threatened by the combined influences of urban development, activities associated with the operation and future closure of the Toa Baja municipal landfill, water channel clearing activities for flood control, and invasive wetland plant species. In addition, other threats include restricted distribution and highly specialized ecological requirements of the species; which may exacerbate other potential threats like landfill leachate pollution, the use of herbicides, brush fires, competition, and environmental effects resulting from climate change.

RECOVERY STRATEGY: The recovery strategy for the coquí llanero includes protection and management of occupied habitat and suitable unoccupied habitat for potential future introductions, and addresses immediate threats that led to its listing. In order to meet the recovery goal of delisting, we must increase the number of coquí llanero populations. This strategy seeks to safeguard the only existing coquí llanero population in case the species does not withstand or recover from a stochastic or catastrophic event. In addition, because of stressors like the reduced geographic distribution, limited dispersal capabilities, and its specialized breeding requirements, the species is likely to have reduced adaptive capabilities in the future. This recovery strategy would increase the species' representation, resiliency and redundancy to

sustain populations in the wild over time. The Service will work closely with partners (e.g., local governments, universities, NGOs, among others) to reduce threats to the only known coquí llanero population, increase understanding of its biology, identify new areas suitable for introductions to establish new populations within the likely historic range, protect the currently occupied habitat, and educate the public about this species and the importance of its conservation. The species should be delisted as a result of the successful implementation of recovery actions delineated in this plan.

RECOVERY OBJECTIVES: The ultimate recovery goal is to remove (delist) the coquí llanero from the Federal List of Endangered and Threatened Wildlife (50 CFR 17.11) by ensuring the long-term viability of the species in the wild. We are defining reasonable delisting criteria with the best available information on this species. Criteria will be reevaluated as new information becomes available.

RECOVERY CRITERIA:

Criteria to Delist the Species

1. Three viable coquí llanero populations demonstrate stable or increasing population trends (addresses Factor A and E).
2. Habitat for three viable coquí llanero populations are protected in perpetuity through a conservation mechanism (e.g., land acquisition, conservation easements) (addresses Factor A).
3. Threats and causes of decline have been reduced or eliminated to a degree that the coquí llanero does not need protection under the ESA (addresses Factor A and E).

ACTIONS NEEDED:

The recovery actions identified below are those that, based on the best available science, we believe are necessary to bring about the recovery of the coquí llanero. We have included an estimated cost to complete the action and priority number[1].

1. Protect and manage the existing wild coquí llanero population and its habitat by implementing habitat management practices and other conservation techniques (e.g. land acquisitions, conservation easements, and by developing management plans) (Priority # 1).
2. Monitor status and trends of the only known coquí llanero population and its habitat (Priority # 1).
3. Develop a habitat suitability model to predict spatial dynamic of the species and to guide future introductions within the likely historic range (Priority # 2).

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[1] Recovery actions are assigned numerical priorities to highlight the relative contribution they may make toward species recovery (48 FR 43098):

Priority 1 - An action that must be taken to prevent extinction or to prevent the species from declining irreversibly.

Priority 2 – An action that must be taken to prevent a significant decline in species population/habitat quality or some other significant negative impact short of extinction.

Priority 3 – All other actions necessary to provide for full recovery of the species.

4. Determine the suitability of other palustrine wetlands within the likely historic range of species to inform and implement an introduction plan (Priority # 1).
5. Facilitate recovery of coquí llanero through public awareness and education (Priority # 2).

DATE OF DELISTING: If all actions are fully funded and implemented as outlined, including full cooperation of all partners needed to achieve recovery, we anticipate that delisting could be achieved by 2030.

ESTIMATED COSTS OF DELISTING: The estimated costs of implementing recovery actions for delisting will total approximately $1,085,000 (Table 1). These costs are based on similar actions conducted for similar species and are offered as a reasonable estimate as we learn more about coquí llanero. Some costs are not determinable at this time, and therefore the total cost of recovery may be higher than this estimate.

Table 1. Recovery actions with estimated cost and priority number.

Recovery Action	**Estimated Cost**	**Priority**
1. **Protect and manage the existing wild coquí llanero population and its habitat by implementing habitat management practices and other conservation techniques.**	$580,000	1
2. **Monitor status and trends of the only known coquí llanero population and its habitat.**	$100,000	1
3. **Develop a habitat suitability model to predict spatial dynamic of the species and to guide future introductions.**	$110,000	2
4. **Determine the suitability of other palustrine wetlands within the historic range of species to inform and implement an introduction plan.**	$275,000	1
5. **Facilitate recovery of coquí llanero through public awareness and education**	$20,000	2
Total Estimated Cost: $1,085,000		

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