

1. Project Title:

An ex-situ initiative to rescue Merida's Whistling Frog, an endangered undescribed *Leptodactylus* species.

2. Names, institutional affiliation, and email address of project leader:

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Member of the IUCN SSC Amphibian Specialist Group of Experts, since 1995.

3. Total funding amount requested from Amphibian Ark in USD\$:

US\$ 5.000,00

4. Executive summary (300 words or less)

This project is aimed to rescue populations of the Merida's Whistling Frog, an endangered undescribed *Leptodactylus* species. This is a Venezuelan amphibian with a much-restricted distribution in a highly perturbed urban habitat. The species has not been described yet, but is already known to be in peril. This will be the second Venezuelan *Leptodactylus* in need of protection besides *Leptodactylus magistris*, an endemic species living outside the Andes (Mijares and La Marca 2004, La Marca, Mijares and Señaris 2008, La Marca *et al.* 2013). No special measurements have been taken to date to protect those species, nor there is official protection for the habitat where they lives.

The aim of this project it to set an ex-situ conservation program for the Merida's Whistling Frog and to produce husbandry guidelines for the same that could be useful for other such *Leptodactylus* species in risk.

There is an urgent need for conservation of this species of *Leptodactylus*. It shares the same geographic distribution *Mannophryne collaris* (although not the same habitat requirements; i.e. sympatran but not syntopic species). As per *M. collaris*, the undescribed species is a high risk of extinction in the wild due to massive habitat destruction through urbanization and other human activities. We plan to set the right conditions to maintain the frogs, obtain the parental stocks and subject them to strict quarantine and biosecurity standards. Frogs will be kept in captivity in the *ex situ* facilities, with the final goal to establish a long-term program of liberations of the offspring in the wild.

5. Introduction

The Merida's Whistling Frog (*Leptodactylus* sp.) is a leptodactylid frog endemic to the city of Merida, in the Venezuelan Andes. The species' range extends for about 100 km² in an altitudinal range from 1160 to 1700 m.asl, within the metropolitan area of Merida city. The species has not yet been included in the IUCN Red List or any other red-listing system, although it is already well known (by our previous experiences in the field) that the species is in badly need of protection. This project also contemplates to formally describe the species, giving it a scientific name that most probably will be that of the place where it comes from: Merida.

The main problem that faces the species is the growing development of Merida city at the expenses of the once exuberant humid forests that dominated the place, which have virtually

disappeared in the whole distribution range. The remaining populations of this amphibian live in a few places in extremely low numbers, surviving in highly fragmented, transformed and polluted habitats.

Undoubtedly, the fate of the species in the wild will be extinction, unless a captive management and breeding program is established to maintain viable populations. The species is badly in need to be rescued. Being a highly endemic taxon, with a very much-restricted distribution, its rescue is a must. The project focuses to preserve the species in its native range, through liberations (re-introductions) of captive-raised descendants into the wild. All founder specimens will come from one already detected remaining population, and prospection is needed to detect other remaining populations. This is the single one *Leptodactylus* species living within the distribution range of this undescribed taxon.

Although there is not a current estimate of numbers of the putative remaining populations, which undoubtedly must be at its lowest value ever, we are confident to get some adult frogs in the wild to set a founder stock and initiate the *ex situ* program. To minimize the risks of inbreeding, we will try to get reproductive parents from as many different places as possible. Additionally, we will be searching for places to set later a re-introduction program based on this *ex-situ* program and do our best to ensure protection of the frogs once the reintroduction program is started.

There is an initial knowledge of the species, through taxonomic and ecologic studies, and also an initial knowledge of captive maintenance through successful reproduction of two couples in captivity, all of them done by the main investigator of this project and his associates. Through a preliminary project that counted with the financial aid of Amphibian Ark, dealing with the sympatric *Mannophryne collaris*, we are familiar with the right ecological requirements to provide the *Leptodactylus* specimens the minimal conditions to keep them and guarantee successful reproduction. We will do some research to know better the biology of the species in the wild, through appropriate field research. We already have detected seemingly suitable places for later release of descendants obtained within this program. To minimize duration and possible risks of the *ex situ* program, we will be working to identify and apply *in situ* threat mitigation measures.

The *ex situ* program for the Mérida's whistling frog will be held within the facilities of the Venezuelan Andean Reptile and Amphibian Conservation Center (VARAC Center) in Merida city, a division of the ONG 'Biocontacto' that have counted with financial support through Amphibian Ark to run programs for endangered Venezuelan Andean endemic frog species, like *Mannophryne collaris*. The VARAC Center operates within the Chorros de Milla Park's Zoo, which has been continuously working since 1950, and we have guarantee to stay there for the *ex situ* program over an anticipated lifespan of four years.

The conservation program contemplates diffusion of the knowledge about this species, as well as habitat protection awareness, through talks and multimedia presentations at local schools, universities, and conservation organizations. To back up this project, is good to say that this is the second captive conservation initiative of an endangered Venezuelan Andean amphibian species taken in the VARAC Center. The precedent program has been carried out by Venezuelan herpetology specialists and trained personnel. The final aim of the *ex situ* program is to establish

an *in situ* conservation program to be run at Mérida's Botanical Garden. Some steps have already been taken towards this goal.

This project counts with the partnership of the Chorros de Milla Zoological Park (which provides working and functional spaces for the VARAC Center), the Botanical Garden of Mérida (which will provide the natural and controlled spaces for later reintroduction of captive-born and raised specimens), the Laboratory of Biogeography of the University of the Andes (which will provide space and the taxonomic expertise to formally describe the new species to science), and that of Biocontacto (the non-governmental organization which will provide veterinary support for the animals). The ex-situ component involves a reforestation program within Merida's Botanical Garden, which has been already initiated through the *Mannophryne collaris* program, aimed to act as threat mitigation measure for the species.

Before starting this project, we kept two couples of the undescribed species in captivity, and we were successful in breeding them. This experience, along with the one gathered maintaining *Mannophryne collaris*, has been of utility to plan for appropriate ex situ facilities guaranteeing adequate enclosure and health conditions for founder animals and their offspring at all life stages.

We have a reasonable good understanding on the taxonomy and conservation status of the species, backed up with ongoing studies to describe the new species, and have studied the ecological and climatic conditions where the species live (e.g. La Marca 1992, 1999, 2012, La Marca *et al.* 2014). Some aspects on behavior, reproduction, feeding, health aspects, etc., need to be extrapolated from the experience with other *Leptodactylus* frogs (e.g. Gibson 2001, Sicchar *et al.* 1995) but will mainly rely on new findings to be acquired through the project. In managing the captive frogs we are adhering to recommended biosecurity standards (e.g. AmphibianArk, 2008 and others).

6. Methodology

The program counts with trained keepers to supervise the frogs and care for the *ex-situ* facilities, which were trained through the initial help of Amphibian Ark supporting the precedent *Mannophryne collaris* program. They also care for the invertebrate food-supply' colonies that provides a reliable and varied live-food items for all stages of the species.

In this project, we will establish the necessary measures for good health (quarantine, medicines, and veterinary protocols), and general maintenance (environmentally controlled spaces, food resources, and enclosures) for the *Leptodactylus* frogs. Climatic conditions will be mimicked with artificial lighting and automated photoperiod, controlled temperatures, artificial rainfall and fogging, as well as automated water flow with a filtering system. Security measures will be taken to avoid potential escapees. All specimens will be subjected to quarantine treatments to prevent transfer of diseases from the wild; and special care will be given to the frogs to avoid risks of diseases in them, among them and upon liberation into the wild. The previous experience through captive maintenance of *Mannophryne collaris* is germane in this regard.

We will follow standard record-keeping protocols to avoid risks of interbreeding and minimize the risks of loss of genetic diversity. The species will be kept isolate in a single room from other species, except for sharing the facilities with the already established colonies of *Mannophryne collaris* that, being a sympatric species, shares the same habitat and ecological problems.

Figs. Adult *Leptodactylus* sp, and it s range of distribution (indicated by a yellow polygon).



7. Budget

Budget category	Item/amount	Requested from AArk	Other sources/ status
Field study	Field vehicle rental, fuel, \$60/day, 20 days	0	\$1,200 Biogeography Lab ULA
	Stipends for local participants \$50/day, 10 days	0	\$500 Biocontacto
	Lodging, 2 people, \$20/day, 4 days	0	\$ 160
	Vehicle maintenance	0	\$150 Biogeography Lab ULA
Ex situ facility	1st year keeper salary	0	\$2,500 Biocontacto
	Foot baths/solutions	\$840	0
	Disposable gloves (\$100 x4)	\$100	0
	Food and culture media for invertebrates	\$400	0
	Plumbing (valves, couplings, PVC pipe)	0	\$1,200 Biocontacto
	Glass (cut and drilled)	\$560	\$0
	Pumps (\$60 x5)	\$300	0
	Thermometer (\$20 x5)	\$100	0
	Plastic enclosures, with lids	\$200	0
	Shelves	0	\$9,000
Light bulbs, timers	\$1,500	0	
Overalls, boots	0	\$1,500	
Field collection	Field vehicle rental, fuel, \$60/day, 10 days	X	
	Food: 5 people \$20/day, 10 days	X	
	Lodging, 5 people, \$50/day, 5 days	X	
Education	Presentations at local schools and conservation organizations		X
Threat mitigation	Reforestation project	0	\$3,000 Biocontacto
	Turtle removal	\$1,000	0
	Trail management	0	\$750
	Fences construction / reparation	0	\$2,300
Total		\$5,000	\$21,060
Percentage		19,19%	80,81%

8. Scientific citations

- Amphibian Ark*. 2008. A guide to biosecurity and husbandry standards require for the safe and responsible management of ex situ populations of amphibians. Standards based upon CBSG/WAZA Amphibian Ex Situ Conservation Planning Workshop, El Valle, Panama, 12-15th February 2006- 2006
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- La Marca, E., A. Mijares-Urrutia & J.C. Señaris.* 2008. Sapito silbador del Socopó [sic], *Leptodactylus magistris*. Pp.217. *In*: J.P. Rodríguez & F. Rojas-Suárez (eds.). *Libro Rojo de la Fauna Venezolana*. Tercera edición. Provita & Shell Venezuela, S.A., Caracas, Venezuela.
- La Marca, E., A. Mijares-Urrutia and J. Selsa Señaris.* 2013. *Leptodactyls magistris*. http://wikieva.org.ve/index.php/Leptodactylus_magistris
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- Sicchar Valdez, L.A., J.G. Gil Navarro and M Chumbe Ayllon.* 1995. Manejo en semi cautiverio de *Leptodactylus pentadactylus* (Laurenti, 1768) "Hualo" (Amphibia:Leptodactylidae). Resultados preliminares

9. Timeline of work

Activity	Jul-Sep 2016	Oct-Dec 2016	Jan-Mar 2017	Apr 2017
Field study and collection	X	X		
ex situ facility	X	X	X	X
Threat mitigation			X	X
Presentation of results				X

10. Supporting letters.

Attached supporting letters same as the preceding project with *Mannophryne collaris*, with the same team, space, and general purposes. Please let me know if you need actualized ones.

A **letter of endorsement** from an unrelated international organization endorsed by a recognized leader in the field of conservation (Ted Kahn).

A **letter of institutional support** from Biocontacto, employer of Principal Investigator.

Proposal submitted to: Kevin Johnson, Taxon Officer. AArk Seed Grant

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