CONSERVING THE ENDANGERED LAGUNA-RAIMUNDA FROG (*ATELOGNATHUS REVERBERII*), ENDEMIC FROM NORTHERN PATAGONIAN STEPPE, ARGENTINA

Progress Report

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SUMMARY OF THE PROJECT

The Laguna-Raymundo Frog (*Atelognathus reverberi*i) is an IUCN Endangered species only known from five temporary shallow lagoons scattered over the northern Patagonian steppe. This species is threatened by the dry off and eutrophication of its aquatic habitat caused by extreme weather but also by the

trampling of livestock. Its area of occupancy is less than 500 km2 and there is a continuing decline in the extent and quality of its habitat. We aim to assess the distributional range and current conservation status of the entire population of this species and to perform concrete actions to promote its long lasting viability.

ACTIVITIES

We performed two field trips between November and October of 2014. Our objectives were, 1) to measure habitat variables at sites of known and unknown occurrence of frogs in order to use them for developing models of potential distribution for the species, 2) to search for new sites of occurrence for the species, 3) to have interviews with local farmers and select potential sites to build artificial ponds and, 4) to perform awareness raising activities.

OBJECTIVES UPDATE

DISTRIBUTIONAL RANGE AND CONSERVATION STATUS

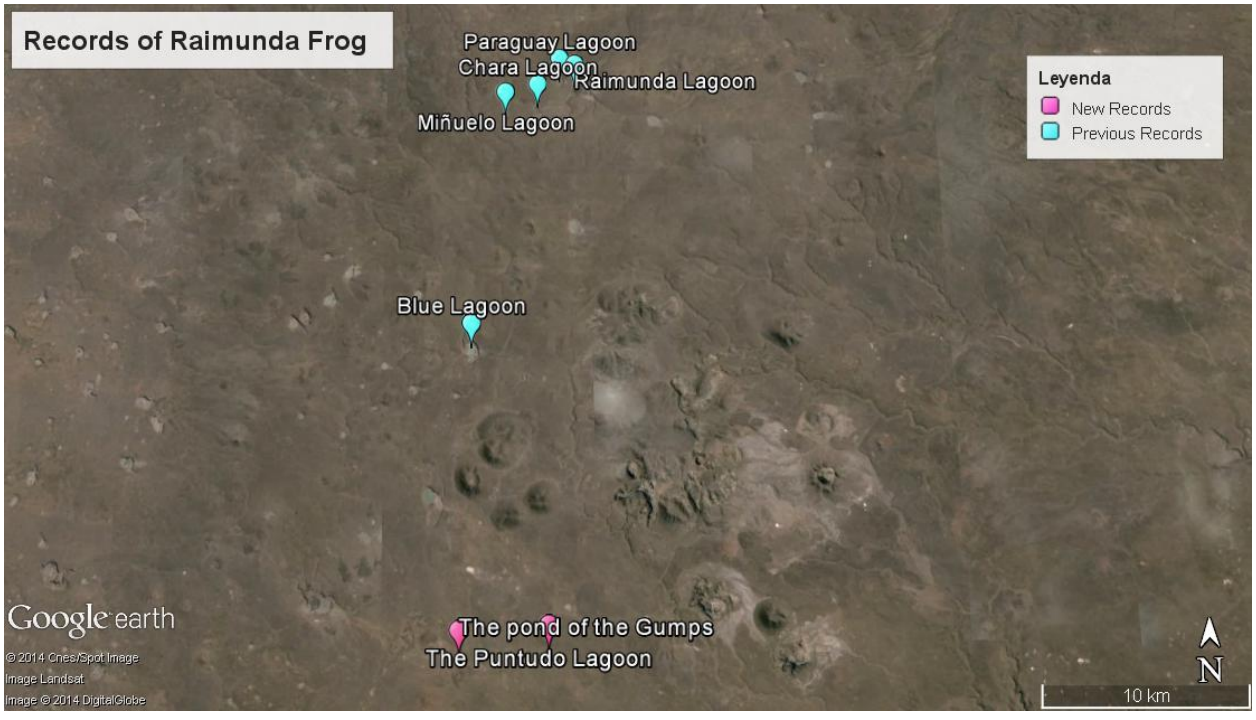
Objective. Distributional range and conservation status of the species updated

Proposed methodology. We will search for frogs on its entire distributional range. We will modeled species distribution using predictive methods (=Maxent), to search for potential habitats. With a set of new information for this frog, we will propose an updated conservation status or information in the IUCN Red.

Activities. We visited 5 sites of known occurrence of the species and 4 sites where the species was not previously detected. Each site was intensively surveyed recording: a) presence and abundance of frogs (juveniles, adults and tadpoles), and; b) habitat variables: size of the lagoon, presence and abundance of vegetation and rocks and type of substrate.

Achievements. We observed frogs only at one of the 5 sites of known occurrence, while we add 2 new localities where the species was never detected before. At one of these new localities we found tadpoles in several metamorphic stadiums, indicating that the species uses that site for reproduction. This site is called the pond of the Gumps (S 41°36', 66°64' W) by local people.

At the second new site (The Puntudo Lagoon - S 41°37' S, 66°80' W), we found a dead individual. This second site was dried, indicating that drought is a threat for the survival of this species. Since drought seems to be more frequent in the area, our project would be of key importance for promoting the long-lasting survival of individuals in the future. The specimen was deposited in the Museo de La Plata. Since the species was previously recorded by Cei, 1969 only at Raimunda Lagoon (S 41°21' S, 66°58' W), Miñuelo Lagoon (Unknown), Paraguay Lagoon (S41°22' S, 66°55' W), Blue Lagoon (S 41°28', 66°83' W) and Chara Lagoon (Unknown), our records represent an extension of the known distributional range for the species.



At the site of known occurrence where we detected individuals (Blue Lagoon), we observed both adults and tadpoles, indicating that individuals use this site for reproduction. However, adults where placed under rocks at the shore of the lagoon whereas tadpoles where detected in a deep water pit (called “jaguel” by local people) placed at 10 mts from the lagoon.

Jaguels are constructed by local people to take water for domestic use when the lagoons become dried. This observation demonstrates that artificial habitats are used by individuals for reproduction, probably because they are less threaten by livestock. In that frame, the habitats that will be created through this project will be probable used as reproduction sites for the species.

Future activities. We will perform two field trips during January and February to continue with these activities. We plan to visit at least a total of 20 sites of potential occurrence of frogs during these months. After that we will use Maxent to develop a model of distribution of the species considering all these variables. We will also model the effect of global charming on frog´s habitat. By updating these information and information related to the effect of threats we will propose an update to the current conservation status of the species and we will send it to IUCN.

Tadpoles and adult individuals detected at the pond of the Gump and Blue Lagoon respectively.

HABITAT REQUIREMENTS

Objective. Knowledge about habitat requirements increased

Proposed activities. At each lagoon, we will record presence, type and abundance of vegetation and rocks, type of substrate, size and depth, PH and temperature. We will use linear generalized models and multivariate approaches in order to search for differences between lagoons used and non-used by frogs.

Achievements. As said before, during the field trips we measured habitat variables at sites of known and unknown occurrence of frogs in order to use them for developing models of potential distribution for the species and to assess habitat use.

We found that lagoons with and without records of frogs have very similar features. The lagoons are semi-permanent, it have clay substrate, scarec shore vegetation and lot of rocks of several sizes placed at the shore and into the water. Aquatic vegetation is scarce or absent.

We found that frogs use shore rocks as shelter during the day. We also found that frogs prefer to leave eggs at small water ponds (instead of lagoons) probably because these habitats are less threaten by livestock. Another hypothesis is that these habitats are less affected by drought. We will test this hypothesis during the next field trips.

Future activities. During the next field trips we will record water parameters (Temperature, Ph, NH_3 /NH_4 , NO_2 , and others) with the aim to assess the existence of differences between lagoons. We will also leave data loggers to measure day variation in water temperature at sites of known occurrence of the frog. At Blue lagoon we will also leave a Frog logger with the aim of recording frog calls (if exist). After these field trips we will analyze the data gathered in order to see if the species has some preferences or if they distribution at lagoons placed at the plateau is at random.

The access to the field sites is very difficult. In these images, the field team working at both, sites of known and of unknown occurrence of the frogs.

Effect of tHREATS

Objective. Knowledge about effect of threats increased

Proposed methodology. At each lagoon (both, with presence and absence of frogs), we will measure presence and frequency of threats (livestock and water contaminants).

We will use occupancy models approaches to search for effects of threats on frogs' occupancy.

Achievements. We observed that livestock is widespread distributed along all the surveyed lagoons, but in small abundances. However, during dry seasons, the lagoons become smaller and the pressure of livestock by trampling and feeding on shore vegetation becomes higher. The effect on frogs is clear since they need these habitats for reproduction, and dry season occurs during reproduction season. By talking with local people we realized that this threat is relatively new, considering that during the last 5 years some permanent lagoons become drought.

Considering contaminants we decided not to analyze water samples. At the start of the project we thought that chemical pollution of waterways from sheep baths was occurring. However, by talking with local people we realized that no contaminants are affecting lagoons, since vaccine are used for sheep Acari instead of chemical baths.

Regarding occupancy models, we got enough data of presence absence of frogs at several points distributed along the surveyed lagoons. However, preliminary analysis do not gave robust results because data are very sparse (too much sites with zero detections).

Future activities. We will continue with planned activities during the next field trips. In the case of contaminants we will measure eutrophication instead of contaminants, considering that this is a more realistic threat that are occurring right now, related with the pressure of livestock. We will measure oxygen in water and water invertebrates to quantify a biotic index that let us know the degree of eutrophication of each lagoon in a

comparative way. We also toke skin samples of frogs (by rubbing a cotton swab) that are currently being analyzed to search for the presence of chytrid fungus.

CREATION OF SANCTUARIES FOR FROGS

Objective. Artificial ponds created in order to develop “natural sanctuaries” for the frogs

Proposed methodology. We will create new habitats of high quality and free of main threats. Steps: 1) interviews with local farmers to select two sites for the creation of the “sanctuaries”; 2) creation of a water well; 3) creation of a pond associated with that water well, and; 3) fencing.

Achievements. We already reach steps 1 and a part of step 2. We also buy solar pumps and equipment to get water from the water wells (SOLARTEC http://www.solartec.com.ar/ - 2 solar modules KS10, 2 modules´supports, 2 electric regulators R15S, 2 batteries 12v (Moura 12MF55 s/m) and 2 water pumps Shurflo

Future work. During February of 2015 we will end step 2 and 3 of the proposed activities.

EDUCATION ACTIVITIES

Objective. Local community and tourist promotes the conservation of this species and its habitats.

Proposed activities. Conferences in local schools and a local Museum. Outreach material. Workshops with local people and Park Rangers. Information updated in social networks.

Achievements. We performed educational activities at school Nº 76, (Chipauquil, Valcheta) and at Instituto CEM 87 (Valcheta) about the ecology and conservation of the Laguna-Raimunda frog.

We performed a clip about the frog problematic that was uploaded to youtube and to our facebook page.

We printed and spread posters and stickers among local community and we also leave a banner showing the importance of this frog at the Valcheta Museum.

Future work. At this moment we are developing outreach material (stickers. posters and pamphlets) that will be spread during educational campaigns. These material will be performed using high resolution images that we got during the previous field trips. Moreover, we are organizing a meeting/workshop at Museo de La Plata in order to show this project in frame of the amphibians world day (28th April).

Educational activities performed in the frame of this project