

# THE RETURN OF THE PATAGONIA FROG (*ATELOGNATHUS PATAGONICUS*) TO THE WHITE LAGOON

PROJECT LEADER. Federico Kacoliris. Museo de La Plata - CONICET. [kacoliris@fcnym.unlp.edu.ar](mailto:kacoliris@fcnym.unlp.edu.ar)

Total funding amount requested from Amphibian Ark: US\$ 5,000

**EXECUTIVE SUMMARY.** The Patagonia frog, *Atelognathus patagonicus*, is in danger. Over the last decade, the wild populations of this species have dramatically declined in more than 90%. The major subpopulation of this species used to be common in Laguna Blanca (White Lagoon) and was surrounded by smaller subpopulations inhabiting neighbor and temporary lagoons into and around Laguna Blanca National Park. However, the introduction of invasive predatory fishes let this major subpopulation gone extinct, affecting the entire species. Even in the smallest lagoons where frogs should be thriving, a combination of threats including grazing, and trampling by livestock, chytrid fungus and *Ranavirus* and desiccation caused by climate change, are pushing this whole species to the brink of extinction. Concerned on this problematic, the National Park Administration started a project aimed to manage invasive fishes in the Laguna Blanca, reducing its exotic populations and making the habitat suitable again for native wildlife. However, natural recolonization by Patagonia frogs is unlikely due to current small populations and bad status of corridors between lagoons. This project is aimed at helping Patagonia frog to return to its home. We will build ex situ facilities near to the Laguna Blanca and establish a survival colony. We also will harvest clutches from neighbor lagoons, to develop them in the ex situ facilities in order to increase its survival. Both, newborns from ex situ mates and eggs developed at the facilities will be reintroduced in restored and fenced habitats within the Laguna Blanca. This project will achieve the return of the Patagonia frog to the White Lagoon, reestablishing the major population of this species, thus increasing the long-lasting viability of the whole species.

## CONSERVATION SIGNIFICANCE OF THIS WORK

The Patagonia frog, *Atelognathus patagonicus*, is an endemic species to north-western Argentinean Patagonia that only occur at a small number of endorreic and isolated lagoons scattered over the volcanic tablelands of Neuquén province (Cuello *et al.*, 2009). The known extent of occurrence for this species is less than 100 km<sup>2</sup> (EOO sensu IUCN criteria). This species used to be common at these lagoons, with the major subpopulation (that represented more than a 50% of the whole species) inhabiting the Laguna Blanca, the main permanent waterbody in the area, with an area of 16 km<sup>2</sup>. Lamentably, between 1943 and 1968 the Laguna Blanca was intentionally infested with invasive and exotic predatory fishes, especially perch (*Percichthys trucha*) and Rainbow trout (*Oncorhynchus mykiss*) (Fox *et al.*, 2005) with touristic purposes, even when the area was declared as National Park in 1945. The effect of these top predators on native frogs was evident and during a decade of surveys without a single record, in 2004, the major subpopulation of Patagonia frog that inhabited this lagoon was formally declared extinct (Fox *et al.*, 2005). The remaining smaller subpopulations resist in the surrounded and isolated lagoons, being at higher risk due not only by human-related threats but also by stochastic factors affecting small population. Even more, between 2010 and 2016, probably as a consequence of the global climate change, a prolonged and severe drought desiccated these small lagoons, increasing the estimated population decline of the species from 50% to more than 90% (Cuello *et al.*, 2015; Cuello *et al.*, 2017). For all these reasons, the Patagonia frog was declared as of Special Value by the National Parks Administration and as Endangered by the IUCN Red List (IUCN, 2010). However, a current update indicates that its status is going worst, and the Critically Endangered category was suggested and is currently under evaluation by IUCN committee.

Concerned on this situation, the authorities of the National Park Laguna Blanca started in 2007 a management plan to reduce and permanently control invasive fishes at the White Lagoon. This management was successful (Sanguinetti *et al.*, 2014), and after ten years, the results indicate a significant decrease in fishes abundance with indirect signs of habitat restoration based on biotic (vegetation recovery) and physical traits (e.g. water transparency). This management was reinforced in help with other management activities conducted by local researchers (Dra. Cuello) that fenced some small lagoons to avoid the access of livestock, alleviating this threat to small subpopulations of these frogs (Administración de Parques Nacionales, 2017; Cuello *et al.*, 2014; Cuello *et al.*, 2016). These researchers, together with the National Parks Agency also conducted an awareness-raising campaign aimed at stopping new reintroductions of exotic fishes. Although this management was very useful to protect the species beyond the White Lagoon, the Patagonia frog is still absent there.

In this project, we will work to achieve the return of the Patagonia frog to the White Lagoon, by launching the first project in this species that will conduct *ex situ* management framed on reintroduction purposes. This project is framed on the fact that the re-establishment of the bigger subpopulation of this frog is needed as a requirement to ensure the long-lasting viability of the species. Since the habitat is being restored and controlled by the National Parks administration, but considering that natural recolonization by frogs is unlikely, we propose an *ex situ* management followed by a reintroduction program to help this species returns home. Because of there already exists a house for Park Rangers and visitors near to the Laguna Blanca, we will use the funds requested to the Start-up program of the Amphibian Ark, to build *ex situ* facilities there. We are confident that this project will be a key step in the long-lasting conservation of this charismatic frog<sup>1</sup>.

**MAIN GOAL.** The main goal of this project is to achieve the return of the Patagonia frog, *Atelognathus patagonicus*, to the Laguna Blanca, as a way to ensure the long-lasting viability of this frog framed on the reestablishment of the major subpopulation of the species

#### Specific goals

1. Develop an Action Plan for the species.
2. Create *ex situ* facilities and establish a survival colony.
3. Assess the potential usefulness of harvesting clutches in the wild to increase survival of newborns at *ex situ* facilities.
4. To create safe habitats in the White Lagoon for frogs.
5. Develop a Reintroduction Program for the species based on individuals coming from objectives 2 and 3.

## METHODOLOGY

### Objective 1. Action Plan

We will conduct a workshop with stakeholders related to the conservation of Patagonia frog in the facilities of the National Park Laguna Blanca (Visitors Center “Nomades”). In this workshop we will develop a Log-Frame for this species and based on it, then, we will write an Action Plan for this

---

<sup>1</sup> *Atelognathus patagonicus* was categorized as Education for Conservation need in the last Conservation Needs Assessment. However, in our point of view, this as other species need to be reassessed. In the 2010 assessment, the Patagonia frog was assumed might recover naturally. However, since then, the population decline increased from 50% to 90%, even in a scenario were some threats were managed. Moreover, the extinct major subpopulation never returned to its habitat. This information was provided by the same researchers that assumed that the species did not need rescue nor *ex situ* management in the assessment of 2010. In the frame of the current information for the species, we are confident that its recovery can be only achieved by a combination of *ex-situ* and *in situ* management, thus a recategorization is needed.

species. We will base it on the Species Action Plan template that is available on the AArk web site, following the recommendations stated in the supporting material given in this page. We are aware that an Action Plan is a pre-requirement to this application as a way to ensure the success of the programmed objectives. However in the case of the Patagonia frog, although no formal action plan still exists, there exist specific conservation goals for the species as it was declared as of Special Value by the National Park Administration, and this project falls within the scope of these general goals. We also already have the commitment from key stakeholders, since they are included within the work team and they participated in the development of this application. We already have been working in the main issues to be included in the Action Plan and, this planned workshop will be intended mainly to formally state these objectives in a document, signed by the participants and to define a schedule of activities to coordinate with them.

*Outcomes.* We expect to have an Action Plan for *Atelognathus patagonicus* signed by participants, including the Administration of National Park, which is the legal manager of the species and the area.

### **Objective 2. Create ex situ facilities and establish survival colony**

We will construct ex situ facilities within the currently existing house for Park Rangers inside the Park. We will apply previous experience gathered during the development of the ex situ project of Valcheta frog (*Pleurodema somuncurense*) which is the first and only ex situ project of endangered amphibians in our country. The National Park Administration already allowed us to construct the amphibians' ex situ facilities at one room of the Park Rangers' house, specifically destined to this aim, which will facilitate the management of individuals following *recommended biosecurity standards* (which will be of low risk, considering that the facilities will be inside the range of the species and *A. patagonicus* will be the only species captive there). In this room, we expect to construct terrariums and aquariums and other facilities to ensure the wellness of individuals. Previous to the reproductive season we will establish there some founder mates in order to assess reproduction traits and to produce new individuals to be considered for the future Reintroduction Program of the species.

*Outcomes.* Ex situ facilities constructed in the Park Rangers house and a survival colony of Patagonia frog established.

### **Objective 3. Harvesting clutches for increase survival**

As a complement for the production of new individuals in the ex situ facilities, for the Reintroduction Program, we will assess the usefulness of harvesting clutches from the wild in the small lagoons that are surrounding the Laguna Blanca. With this management, we expect to increase the survival of tadpoles and juveniles to have more individuals for reintroduction. After metamorphosis we will destine a half of these individuals to return to its original habitat (the lagoon where they were harvested) and the other half of individuals together with the individuals produced by the captive mates will be reintroduced in fenced and restored habitats ("sanctuaries") within the Laguna Blanca.

*Outcomes.* Usefulness of harvesting clutches and develop them in the ex situ facilities tested.

### **Objective 4. Create safe habitats**

Current management activities conducted by the Administration of National Parks ensure a low abundance of invasive fishes in the lagoon and the restoration of native vegetation. However, some fishes are still there and, because the size of the lagoon, its complete eradication is unlikely. For this reason, in the frame of this project, we will concentrate efforts on fencing some specific sites in the lagoon, avoiding the access of exotic fishes. These sanctuaries will be the places where the Reintroduction Program will be conducted.

*Outcomes.* The first sanctuary for frogs in the Laguna Blanca created.

## Objective 5. Develop a Reintroduction Program

After the development of the activities planned in objectives 2, 3 and 4 we will integrate the results obtained in the Action Plan developed in objective 1 in a specific section destined to set the basis for the development of a Reintroduction Program. We will decide herein, which combination of activities could result in a higher success with the goal of reestablishing a subpopulation of Patagonia frog in the sanctuary created in the frame of the objective 4.

Outcomes. A reintroduction strategy included to the Action Plan for the species exist and is promoted to start in the short-term (we expect to start a first reintroduction experience at ends of 2019 or firsts of 2020).

## BUDGET

Budget category	Item/amount	Requested from AArK	Other sources/status
<b>Workshop for Action Plan</b>	Round trip airfare, \$100/people, 2 people	\$0	\$200 supported by MLP
	Round trip bus fare, \$30/people, 6 people	\$0	\$180 supported by CYU
	food: 8 people \$20/day, 4 days	\$0	\$640 supported by AF
<b>Ex situ facility</b> <i>52% of the total amount requested to AArK</i>	Retrofit existing building	\$600	\$400 supported by APN
	1st year keeper salary	0	\$6,000 supported by APN
	Air conditioner	\$250	0
	Terrariums	\$500	0
	Water supply filtering system	\$500	0
	Foot baths/solutions	\$50	0
	Disposable gloves	\$100	0
	Supplies for live food culture	\$600	0
<b>Field collection and harvest of clutches</b>	Field vehicle rental, fuel, \$60/day, 30 days	\$1,200	\$600 supported by APN
	Food: 4 people \$15/day, 30 days	\$800	\$1,000 supported by MLP
	Lodging: 4 people, \$50/day, 2 days	\$400	0
	PI salary for 30 days	0	\$1,500 supported by C
<b>Threat mitigation</b>	Fish removal	0	\$5,500 supported by APN
	Fencing key habitats	0	\$5,000 requested to RSG
<b>Total</b>		\$5,000	\$21,020
<b>Percentage</b>		19%	81%

\*MLP: La Plata Museum; CU: Comahue University; AF: Fundación Félix de Azara; APN: National Park Administration; C: CONICET; RSG: Rufford Small Grants.

## WORK TEAM

### Project leader

Kacoliris Federico. Museo de La Plata – CONICET. Principal Investigator and main coordinator. Dr. Kacoliris will be at charge of the *ex situ* management and the reintroduction program.

### Coordinators

- María Elena Cuello. Universidad del Comahue, Patagonia. Field and research coordinator. Dra. Cuello, as the specialist in this species, will be at charge of in situ and ex situ reproductive researches and monitoring activities.
- Leonardo Buria. Administración de Parques Nacionales, Delegación Sur. As technician of APN, Dr. Buria will be the link with the National Park Administration. He also is who is currently developing fish management and will be at charge of the creation of sanctuaries.

## Collaborators

Melina Velasco (Museo de La Plata – CONICET); Rodrigo Calvo (Universidad Nacional de La Plata); Agustina Oliva (Universidad Nacional de La Plata); Hernán Pastore (Administración de Parques Nacionales, Delegación Sur); Erika Kubish (Universidad del Comahue, Patagonia – CONICET)

## Advisors

- Jorge Williams. Museo de La Plata.
- Carmen Úbeda. Universidad del Comahue, Patagonia.

## TIMELINE OF WORK

Activity	Sep-Oct 2018	Nov-Dic 2018	Jan-Feb 2019	Mar-Apr 2019	May-Jun 2019	Jul-Aug 2019
Action plan						
Construct <i>ex situ</i> facilities						
Field collection						
Field harvest						
In situ management						
Reports, manuscripts						

## BIBLIOGRAPHY

- Administración de Parques Nacionales. 2017. Plan de Gestión del Parque Nacional Laguna Blanca. ResHD. 476/17. [https://www.sib.gov.ar/archivos/PG\\_PN\\_Laguna\\_Blanca.pdf](https://www.sib.gov.ar/archivos/PG_PN_Laguna_Blanca.pdf).
- Cuello, M.E., Perotti, M.G. and Iglesias, G.J. 2009. Dramatic decline and range contraction of the Endangered Patagonian frog *Atelognathus patagonicus* (Anura, Leptodactylidae). *Oryx* 43(3): 443-446.
- Cuello, M.E., Úbeda, C.A., Bello, M.T. and Perotti, M.G. 2014. Plastic patterns in larval development of Endangered endemic *Atelognathus patagonicus*: implications for conservation strategies. *Endangered Species Research* 23(1): 83-92.
- Cuello, M.E., Úbeda, C. and Bello, M.T. 2015. Prolongada y extrema sequía en el noreste de la Patagonia Argentina afecta al anuro endémico *Atelognathus patagonicus*. *Congreso Argentino de Herpetología, Tucumán*.
- Cuello, M.E., Úbeda, C.A. and Bello, M.T. 2017. Habitat Associations for the Endangered Frog *Atelognathus patagonicus* Within the Aquatic Environment: Key Microhabitats for Conservation. *Herpetological Conservation and Biology* 12(2): 410-421.
- Fox, S.F., Yoshioka, J.H., Cuello, M.E., and Úbeda, C. 2005. Status, distribution, and ecology of an endangered semi-aquatic frog (*Atelognathus patagonicus*) of northwestern Patagonia, Argentina. *Copeia*: 921-929
- Sanguinetti, J., Buria, L., Malmierca, L., Valenzuela, A., Núñez, C., Pastore, H., Chauchard, L., Ferreyra, N., Massaccesi, G., Gallo, E. and Chehébar, C. 2014. Manejo de especies exóticas invasoras en Patagonia, Argentina: Priorización, logros y desafíos de integración entre ciencia y gestión identificados desde la Administración de Parques Nacionales. *Ecología Austral* 24: 183-192.
- Úbeda, C., Lavilla, E., Basso, N. 2010. *Atelognathus patagonicus*. The IUCN Red List of Threatened Species 2010: e.T56323A11459931. <http://dx.doi.org/10.2305/IUCN.UK.2010-2.RLTS.T56323A11459931.en>. Downloaded on 26 July 2018.