Project Update: April 2019

The first half of this 1-year grant has been very exciting, we're very positive that this project is making a great contribution to the conservation of southern Darwin's frogs (*Rhinoderma darwinii*). During the execution of two previous Rufford Small Grants, we confirmed a sad suspicion: individuals of this species are very susceptible to develop fatal chytridiomycosis. Worryingly, this emerging fungal disease has the potential to drive its local populations to extinction. Thus, for this booster grant we decided to leap into action and trial a short- to medium-term mitigation action against chytridiomycosis in southern Darwin's frogs. This consists of an exclusionary fence surrounding a free-living population of the species (with six replicates). The field logistics have not been easy at all; we had to move a lot of big aluminium sheets and wooden stakes across dense native forests, across streams and steep areas, most time during harsh weather (Fig. 1A). But the result has been incredibly encouraging! We have successfully installed three exclusionary fences (Fig. 1B-D), which are now fully operative (i.e. putative chytridiomycosis reservoirs have been excluded and Darwin's frog populations monitored once a month since October 2018). What is the purpose of these exclusionary fences? Well, we hypothesise that syntopic amphibian are transmitting the chytrid fungus to Darwin's frogs. To further evaluate this, we have also set an observational study to explore interspecific interactions within an assemblage of native forest amphibians: Darwin's frogs, rosy ground frogs (*Eupsophus roseus*) and grey wood frogs (*Batrachyla leptopus*; Fig. 2B). These two last species are suspected to be the chytridiomycosis reservoirs. For this observational study, we have identified two Darwin's frog metapopulations (one in Contulmo and the other in Neltume). Six 20 x 20 m plots, delimited in the field with plastic strings (Fig. 2A), have been installed at each metapopulation. Each plot is surrounding a local Darwin's frog population. Therefore, this study is allowing us to also study other important ecological processes, such as host and pathogen dispersal in the forest landscape (Fig. 2C). But feeling that this is just not enough, we are pushing forward our outreach work at local communities. Ten (from a total of 20) pop science books ("Discovering the Darwin's frogs) have been already distributed among local people during our conservation talks and forest excursions (Fig. 2D).

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A project webpage is available at: **https://www.ranitadedarwin.org/emerge**. For further information please send me an email to: **andresvalenzuela.zoo@gmail.com**

Figure 1 Installation of the exclusionary fences, a mitigation action against chytridiomycosis in Darwin's frog populations. In A) fieldworkers move the aluminium sheets used to build the enclosures. In B) a fieldworker is digging the ditch required for the fence during a day of harsh weather. Fences that have been successfully installed are shown in C and D.

Figure 2. Research and outreach work. A) Prof. Andrew Cunningham and Andrés Valenzuela (PI) try to unravel the strings during plots installation. In B) a gray wood frog, potential reservoir of the chytrid fungus, tries to go unnoticed in the forest floor, while in C) the spatial location of this frog is measured within the study plot. During our outreach activities, we gave the book "Discovering the Darwin's frog" to local people.