



Detailed Report

HIGH ANDEAN AMPHIBIAN CONSERVATION INITIATIVE OF THE LAKE JUNÍN BASIN

Junín, Peru, 2018 - 2019

Special Thanks

We wish to thank the Rufford Foundation for its generosity and contribution to this project and for the trust placed in us, that has allowed us to meet the proposed objectives and thus contribute to the conservation of both *Telmatobius macrostomus* and *Telmatobius brachydactylus*.

The Rufford Foundation's support was key to get the grant from the National Geographic Society that supported us in two additional projects: "Expedition search for threatened frogs (*Telmatobius macrostomus* and *Telmatobius brachydactylus*) in historic sites" and "The First High School BioBlitz in the Junín National Reserve". We were able to magnify the results obtained by having The Rufford Foundation's backing.

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And finally, to those who directed the project, our team from the NGO Grupo RANA, thank you for all the times we got back up, after the falls and for all the lessons we learned and challenges we faced together, for putting the soul into this project, for the laughs that were never lacking and because we didn't stop believing in our dreams, especially in that dream we pursue, the dream of increasing the populations of and protecting both *T. macrostomus* and *T. brachydactylus*.

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Introduction

In citizen science projects, members of the public participate in scientific research in different contexts (Shirk et al., 2012). Participants gain in knowledge, raise public awareness about biological diversity, about scientific research and provide a deeper meaning to their hobbies (Bonney, Phillips, Ballard, & Enck, 2016). This project was developed in a context of conservation and resource management, the Junín National Reserve, recognized as a RAMSAR site, conserves the flora and fauna of Lake Junín, the highest and the second largest lake in Peru (INRENA, 2008). This natural area protected by the government of Peru is part of the distribution of *Telmatobius macrostomus* (Giant frog of Lake Junín) and *Telmatobius brachydactylus* (the Wancha of Junín), two endemic and highly amphibians, which currently suffer threats such as illegal hunting, introduction of the non-native species, *Oncorhynchus mykiss* (trout), climate change, alteration and degradation of habitat due to mining, sewage, pollution and modification of streams by channeling and subsequent cleaning of canals.

The purpose of the project was to bring lay people closer to the conservation of both amphibian species through: (a) a high school citizen science program, consisting of 153 students and 10 teachers in 7 educational institutions, who through environmental education and field monitoring increased their knowledge in relation to both frogs and contributed data to science, (b) accompaniment workshops to the ranching community of Ondores in their canal cleaning activities, during which, awareness was raised about the stress exerted by this activity on habitats and proposing a more responsible cleaning of channels was shared, (c) design and installation of two travelling interpretive panels in the interpretation centers of the reserve, available for both visitors and tourists designed with information on the current situation of frogs (d) sharing of results in different local open forum opportunities (e) dissemination of infographic content in social media networks for the non-local population.

Through this project, we engaged the local population, different institutions and organizations, and linked additional activities to increase the results, contributed to science and made public the knowledge of the critical state of the frogs of Junín.

1. Background

1.1. Current situation of high Andean frogs

Amphibians, a unique group of vertebrates that comprise more than 7,000 known species, are threatened worldwide. A global evaluation conducted in 2004 found that almost one third (32%) of the world's amphibians are threatened, representing 1,856 species. Amphibians have existed on earth for more than 300 million years, however, in the last two decades they have had an alarming number of extinctions, it is believed that almost 168 species have become extinct and at least 2,469 (43%) more have declining populations (AmphibiaWeb, 2019)

Peru is a mega-diverse country, home to 638 species of amphibians (AmphibiaWeb, 2019). Likewise, 27 species of amphibians of the genus *Telmatobius* have been registered in Peru (IUCN, 2019). *Telmatobius* is a genus that has evolved in relation to the aquatic ecosystems of the Andes and their mountain ranges, most of these species live between 3000 to 4000 meters above sea level (Barrionuevo, 2016).

The Junín National Reserve is home to two endangered / endemic amphibian of the genus *Telmatobius*; *Telmatobius macrostomus* and *Telmatobius brachydactylus*. Direct threats affecting *T. macrostomus* and *T. brachydactylus* include loss, degradation and fragmentation of habitat through resource extraction (burning of bulrush and sod extraction), overgrazing (of sheep, cows and camelids), pollution (from mining waste, municipal wastewater, agrochemicals, etc.), fluctuations in water levels as controlled by the Upamayo dam, the introduction of rainbow trout (*Oncorhynchus mykiss*) and the overexploitation of frogs for human consumption, both for subsistence as a source of protein and for commercial purposes. In addition, the projected climate change models indicate the increase in temperatures in the higher altitude regions of the tropical Andes (Watson et al., 2016).

1.2. Problem analysis

The problem we wish to solve is the decrease in the populations of *T. macrostomus* and *T. brachydactylus*, this problem is caused by a variety of threats identified in the problem tree. One of the main causes is, "the disinterest of people in conserving the frogs". This disinterest causes an ignorance of the current situation of both amphibians and a local environmental unconsciousness, which are due to the lack of diffusion and promotion of information on

the current situation of the frogs. Another local threat is very little local participation, involvement and collaboration in the conservation of these frogs and a general lack of any conservation education around frogs in the local education system (figure 1).

In our attempt to address these challenges, we transform the problem tree into an objective tree (figure 2), in which emerges as the main objective; to Increase the populations of *T. macrostomus* and *T. brachydactylus*. To achieve this objective, it is essential to develop the secondary objectives, one of which is "to bring people closer to the conservation efforts of the high Andean frogs *T. macrostomus* and *T. brachydactylus*". It is from this secondary objective that the proposal for the present project called " The High Andean Amphibian Conservation Initiative of the Junín Lake Basin" was born, which sought as its goal to bring information about the frogs of Junín to the local and non-local populations.

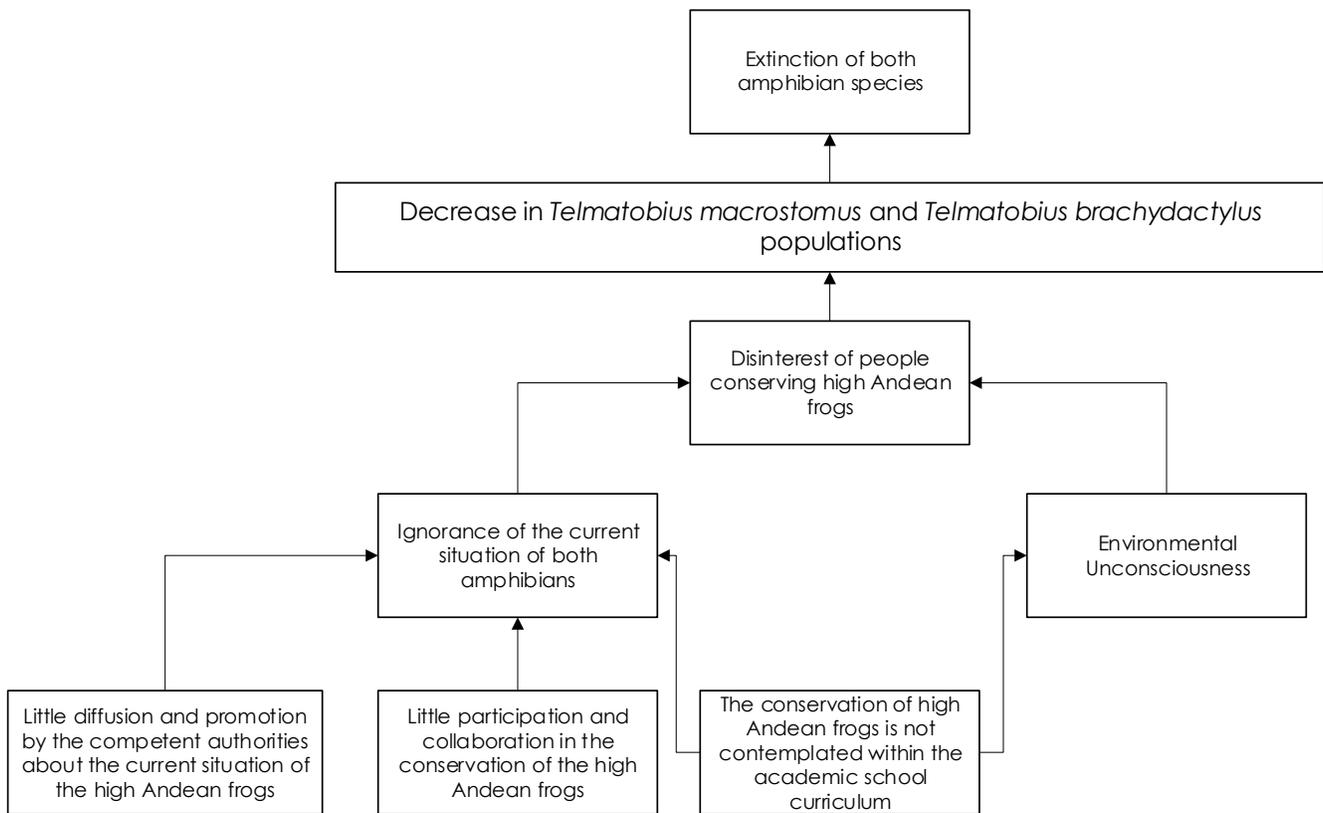


Figure 1. Problem tree (section: disinterest of the population in frog conservation)

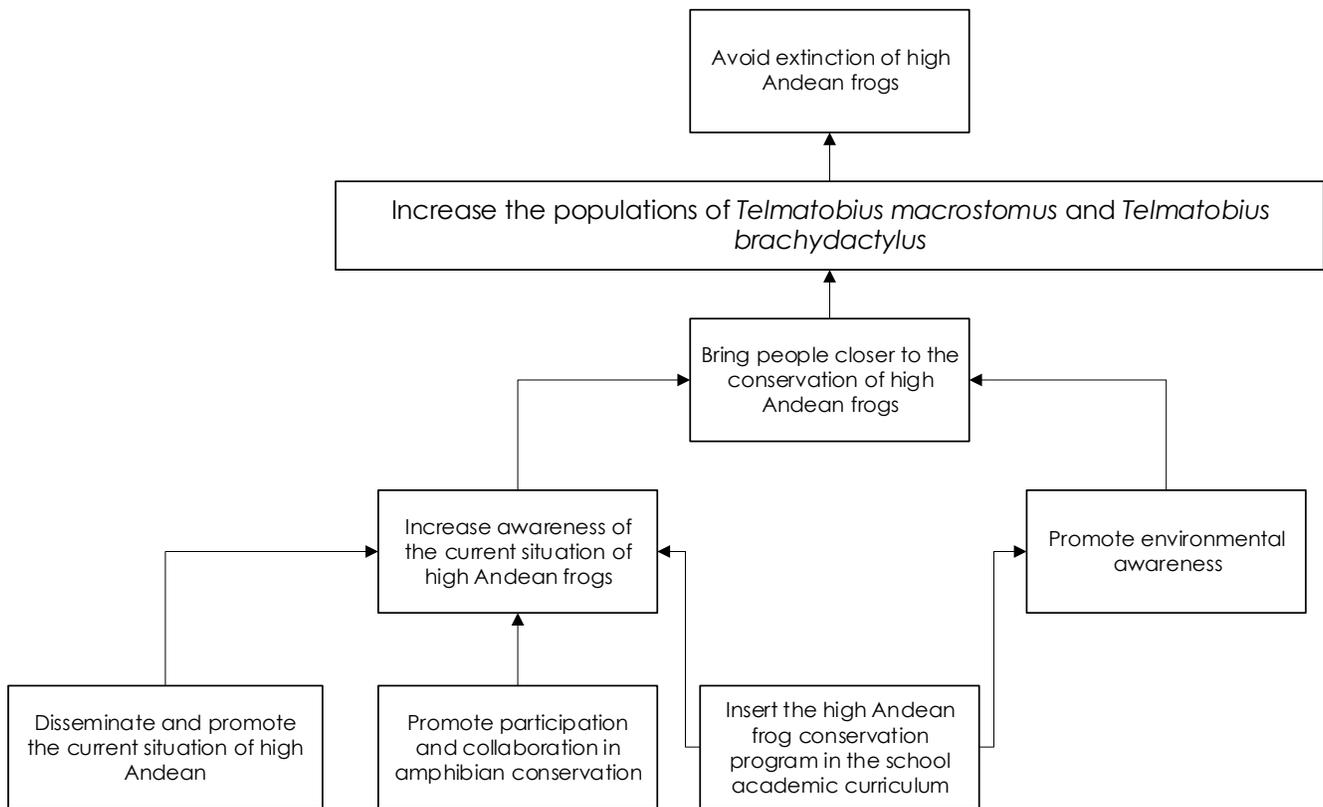


Figure 2. Objective tree (section: bringing the population closer to the conservation of frogs)

2. Project objectives

- First Objective “Citizen Science Program”

Local students will gain environmental awareness through environmental education workshops framed in a citizen science program with field trips where they participate in the collection of data, development of a research as co-researchers and the generation of data to be used by researchers in the management of Junín’s threatened frog species.

- Second Objective “Cleaning of canals in the ranching community of Ondores”

Community members (adults) will develop an environmental awareness through meetings and field visits during canal cleaning efforts (in frogs’ habitats) in a sector of a ranching community.

- Third Objective “Interpretative panels for visitors”

Visitors will gain knowledge and environmental awareness through the park’s interpretation center that will have a travelling interpretive panel about the frogs of Lake Junín.

- Fourth Objective “Sharing of results”

The results and experience were shared in the Chinchaycocha Environmental Committee and Management Committee of the Junín National Reserve (open forum opportunities for participation of public and private institutions and local society with the aim of planning and implementing environmental activities) in order to awaken the interest in the sustainability of the project.

– Fifth Objective “Infographics in social networks”

Non-local populations learned about the current situation of frogs with scientific information presented in infographics through social networks and audiovisual media, in order to generate media interest.

3. Development and the results achieved

The Junín National Reserve, a natural area protected by the government of Peru, located in the Central Andes, in the districts of Carhuamayo, Ondores and Junín, specifically in the Junín region (Junín region is home to 41,052 hectares, or an equivalent to 77% of the total area). The lake also falls in the districts of Ninacaca and Vicco of the Pasco region (11,948 hectares or the equivalent to 23% of the total area). The surrounding wetlands area (approx. 53,000 hectares), in the Pampas of Junín also called the high plateau of Bombón, is located near the site of the historic battle of Junín, at 4,100 masl. (INRENA, 2008).

Most of its surface of this wetland area is occupied by Lake Junín or Chinchaycocha, as it is the second largest lake in Peru and one of the main tributaries of the Amazon basin, fulfilling a series of environmental needs, among which, water collection, hydropower generation and conservation of ecological balance are highlighted (INRENA, 2008).

This project is specifically aimed at the districts of Carhuamayo, Ondores and Junín, and was developed in this area to achieve the objectives for which it was formulated.

3.1. Citizen Science Program

3.1.1. The Pilot Program for Citizen Science Focused on Environmental Education for the Conservation of High Andean Amphibians (*Telmatobius macrostomus* and *Telmatobius brachydactylus*) in Local Students of the Province of Junín 2019

The participation of students in scientific monitoring allows them to approach science, as they acquire new learning and skills and gain a deeper understanding

of scientific work in more engaging ways (Wiederhold et al., 2013). In that sense, a pilot program for citizen science was developed in the area of the Junín National Reserve and its buffer zone, a natural area protected by the government of Peru. This program sought to increase the participants' knowledge of conservation issues regarding *T. macrostomus* and *T. brachydactylus*, and to contribute to science through the collection of monitoring data with the species *T. macrostomus* and *T. brachydactylus*.

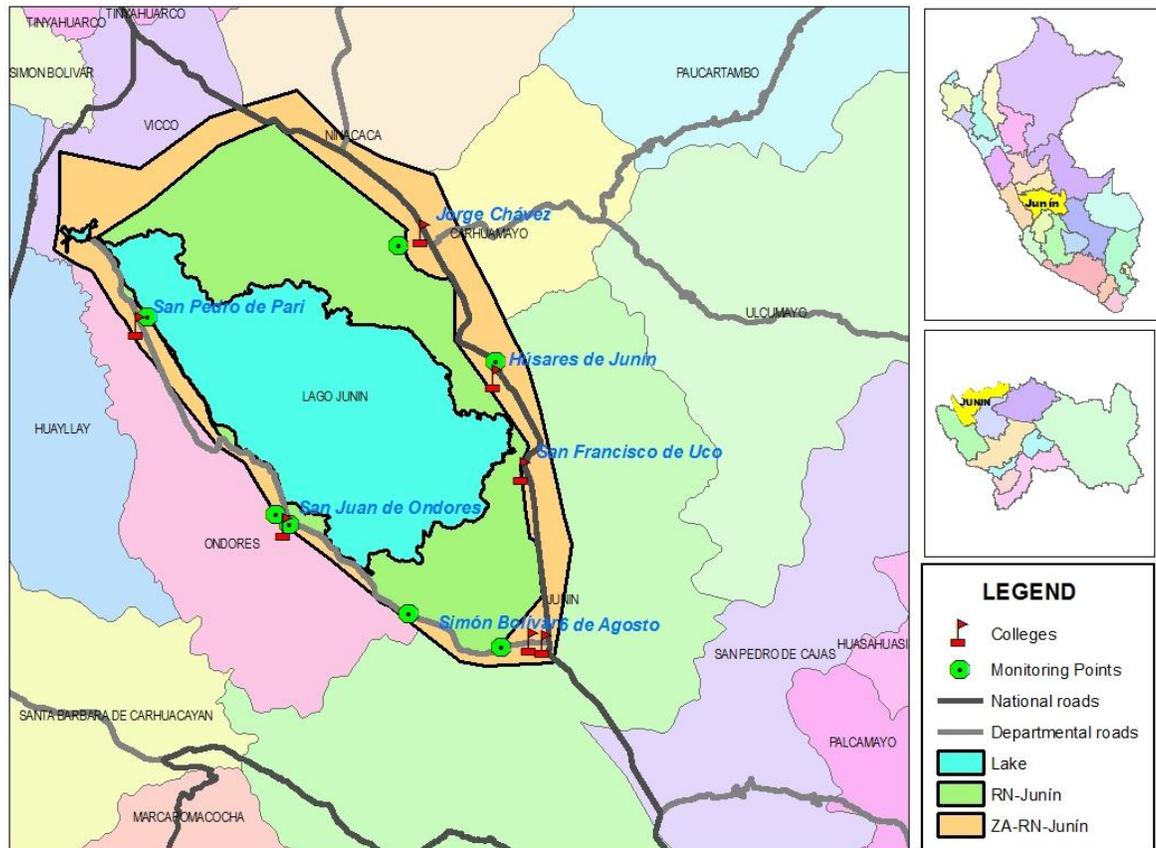


Figure 3. Distribution map of the participating educational institutions and monitoring points

3.1.1.1. Methodology

Seven educational institutions were chosen with three common criteria; a) an express interest in being part of the program, b) that they be public schools c) that they be located near historic sites where frogs have been found. 153 students (between the ages of 12 to 14 years) and 10 teachers participated (Table 1). Six learning sessions were taught, both theoretical (inside the educational institutions) and practical (in the field) (Table 2) over five months (from May to September 2019). Each session lasted 90 minutes, the content was developed taking into

account the skills and competencies set in the science and technology section of the school curriculum, and with the support of the Amphibian Ark manuals.

Table 1. Participants by educational institution

| Educational Institution | Female | Male | Teachers | Subtotal |
|--------------------------|--------|------|----------|----------|
| Libertador Simón Bolívar | 29 | 20 | 1 | 50 |
| 6 de Agosto | 22 | 15 | 1 | 38 |
| Jorge Chávez Dartnell | 14 | 10 | 2 | 26 |
| Húsares de Junín | 6 | 3 | 2 | 11 |
| San Juan | 2 | 6 | 1 | 9 |
| San Francisco de Uco | 2 | 3 | 2 | 7 |
| San Pedro | 9 | 12 | 1 | 22 |
| Total | 84 | 69 | 10 | 163 |

Table 2. Description of the learning sessions

| Learning session | Type | Title | Description |
|------------------|----------|-----------------------------------|---|
| First | Theory | My role in Citizen Science | The content and purpose of the program was explained. Citizen science and the benefits were described. The current situation of <i>T. macrostomus</i> and <i>T. brachydactylus</i> was described, and students were asked to reflect upon how they might help in the conservation of these species. |
| Second | Practice | Alert. They are under threat! | The threats faced by amphibians were presented, and later reiterated a field trip. |
| Third | Theory | I prepare and learn more from you | Description of frogs' habitat, what is involved in monitoring frogs (description of methodology and materials) and field safety were shared. |
| Fourth | Practice | I'll meet you | Field trip, guided frog monitoring, data collection. |
| Fifth | Theory | I contribute with my data | Demonstrating knowledge other amphibians in the world, contribution of the data obtained to citizen science, use of I-naturalist |

| | | | |
|-------|----------|--------------------------|--|
| Sixth | Practice | I am part of the science | Field trip led Grupo RANA and teachers. Students presented their group projects. |
|-------|----------|--------------------------|--|

3.1.1.1.1. Monitoring

The search for individual frogs was carried out by teams composed of a specialist and three students in each group, they slowly travelled a transect of approximately 100 meters using nets and buckets, moving upstream, and carefully examining all available shelters for frogs (e.g., under ledges or around large rocks) (Watson et al., 2017).



Figure 4. Search for individuals of *T. macrostomus* and *T. brachydactylus*

Captured individuals were identified by species, stage of development (tadpoles), sex (for adults), snout-cloaca length and body mass. Once the data collection was finished, the individuals were released at the capture site (Puerta-Piñero, Gullison, & Condit, 2014). Similarly, presence or absence of *Orestias* (native fish) and rainbow trout, *Oncorhynchus mykiss*, were tracked at each site and the pH of the water was measured. The data collected is analyzed with descriptive statistics in the Microsoft Excel software. In some place's evaluations were carried out in two different visits (Chacachimpa, Lan Lan, Rio Amarillo). Some of the participants shared their observations on the I-naturalist platform.



Figure 5. Individual morphometric data collection

3.1.1.1.2. Impact of the program on knowledge

The evaluation of the program was quasi-experimental, by a comparison of groups. We used a group that participated in the program, (24 students) with a group of students (same age) who had not participated in the program as the control group (34 students). For this comparison, only one educational institution was chosen. A short survey of 10 questions was given to both groups of students as an instrument, which evaluated the knowledge acquired during the implementation of the citizen science program, the evaluation score ranged from 0 to 10 where each question had a value of 1 point, 0 being the minimum value and 10 the maximum value.

3.1.1.2. Results and Discussion

3.1.1.2.1. Monitoring

Seven sites were evaluated, some of them were evaluated twice (Chacachimpa, Lan Lan and Yellow River), in none of the monitored sites was *O. mykiss* (trout) found, and in 5 sites there was presence of *Orestias*. As for the pH, the lowest value that was measured was 7.4 to 8.5 as the highest (table 3).

Table 3. Sites and parameters evaluated

| Site | pH | Presence of Orestias | Presence of ONMY | Species found |
|--------------|------|----------------------|------------------|--------------------------|
| Chacachimpa | 7.6 | Yes | No | <i>T. macrostomus</i> |
| Lan Lan | 8 | Yes | No | <i>T. macrostomus</i> |
| Hualamayo | 8.5 | Yes | No | - |
| Paccha | 7.9 | Yes | No | <i>T. brachydactylus</i> |
| Ayac | 7.4 | No | No | <i>T. brachydactylus</i> |
| Río Amarillo | 8.25 | Yes | No | <i>T. macrostomus</i> |
| Pari | 7.5 | No | No | - |

Table 4. pH of the sites where *T. macrostomus* were found

| Site | pH | Promedio | Coefficiente de Variación |
|--------------|------|-------------|---------------------------|
| Chacachimpa | 7.6 | | |
| Lan Lan | 8 | 7.95 ± 0.33 | 4.12 |
| Río Amarillo | 8.25 | | |

Only in five of the visited sites were individuals of at least one species found, in each place where *T. macrostomus* was found there was also presence of *Orestias* (Table 3), this is consistent with a study that characterized the microhabitat of tadpoles of *T. macrostomus*, which positively associates the presence of these fish with tadpoles (Castillo, 2017).

A habitat characterization study identified five variables that are associated with the probability of finding or not finding *T. macrostomus* in the rivers and streams surrounding Lake Junín. The percentage of *Chironomidae* is the best predictor of the appearance of *T. macrostomus*, followed by pH, silt percentage, the specific conduct and the presence of rainbow trout *O. mykiss* (Watson et al., 2017). Of these five variables, pH and the presence or absence of *O. mykiss* were taken into account by the students participating in this project. No trout were found in any of the sites evaluated, these are predators classified as direct threats to both anuran species. (Watson et al., 2016).

Changes in the pH of the aquatic environment affect tadpoles as an acidic pH causes the loss of sodium (Na) stability in their body leading to death. (Freda & Dunson, 1984). In this pilot, none of the sites evaluated had an acidic pH, the

average pH for sites where they had *T. macrostomus*, was 7.95 (n = 3) (table 4), this value however is for three sites evaluated. The habitat characterization study where *T. macrostomus* occurs estimated an average pH value 8.38 (n = 8) (Watson et al., 2016), specifically in the study of habitat preference of tadpoles of *T. macrostomus*, the average pH was found to be 8.28 (n = 10) at the sites where tadpoles were found (Castillo, 2017).

Table 5. Biological Data for the adults found

| Species | Stage | Sex | Mass (g) | SVL (mm) |
|--------------------------|-------|--------|----------|----------|
| <i>T. macrostomus</i> | Adult | Female | 555 | 179.44 |
| <i>T. macrostomus</i> | Adult | Female | 412 | 146.37 |
| <i>T. brachydactylus</i> | Adult | Female | 94 | 84.45 |
| <i>T. brachydactylus</i> | Adult | Male | 28 | 67.92 |

Table 5 has biological information for the adult individuals found. It is noted that adults of *T. macrostomus* (Giant Frog of Lake Junín) have greater mass and SVL (snout to vent length).

An amphibian bulletin of the central highlands of Peru indicated that the SVL length for *T. macrostomus* ranged from 124 mm to 285 mm, and for *T. brachydactylus*, the length SVL, ranged from 58 mm to 82 mm (Sinsch, 1986), the longest SVL measure for *T. brachydactylus* is 84.45, this measure extends the range described.

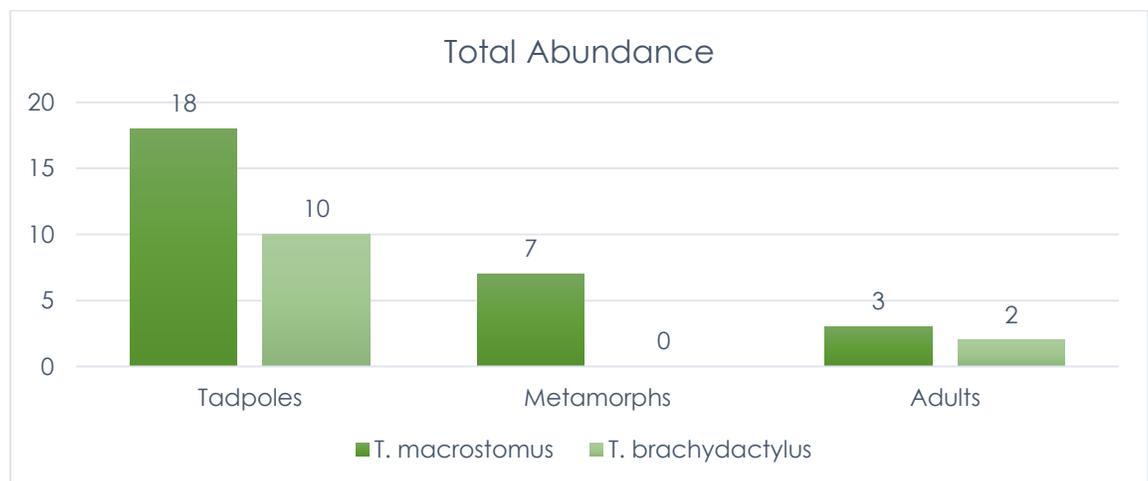


Figure 6. Total abundance of individuals

More tadpoles were found than metamorphs or adults (Figure 6). The abundance of *T. macrostomus* was greater than that of *T. brachydactylus*. However, keep in mind that three sites where *T. macrostomus* were observed and only two in which *T. brachydactylus* were observed.

Table 6. Individuals found at the sites visited twice.

| | Lan Lan | | Chacachimpa | | Río Amarillo | |
|------------|------------|----------|-------------|----------|--------------|----------|
| | Moment A | Moment B | Moment A | Moment B | Moment A | Moment B |
| | Renacuajos | 0 | 1 | 3 | 3 | 0 |
| Metamorfos | 1 | 1 | 1 | 0 | 2 | 2 |
| Adultos | 0 | 0 | 0 | 1 | 0 | 0 |

Table 6 shows the sites where two observations were made, in Lan Lan an additional individual was found during the second field outing. In Chacachimpa, the number of individuals found remained constant and in the second outing to the Yellow River, more than twice as many individuals were found than in relation to the first visit. Each repeat visit was made at least one month apart, it is likely that in the second moment more individuals were found because the students improved their capture skills, but there is not enough data to verify that statement. It is necessary to evaluate more parameters and carry out monitoring in both the dry and rainy season, to have a better comparison.

3.1.1.2.2. Impact of the program on knowledge

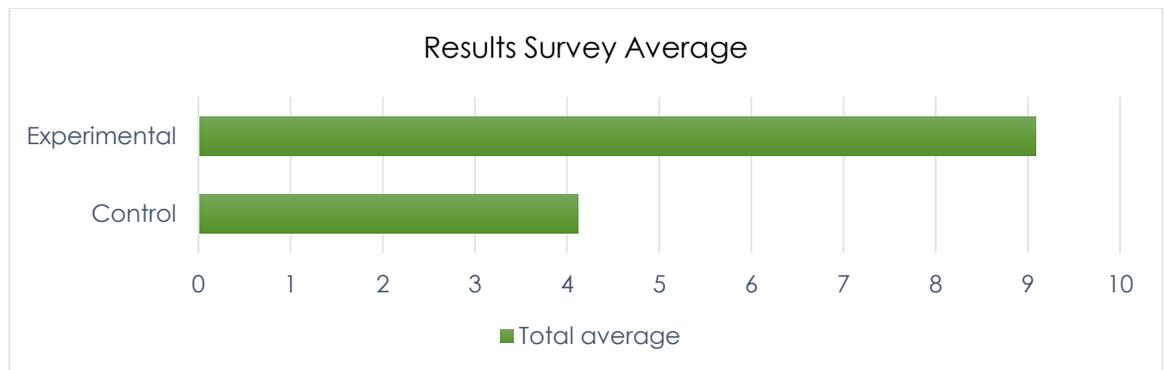


Figure 7. Average total score obtained by each group

The total average score obtained by the experimental group on the survey was higher than the control group (table 7). This indicates that the program had a positive effect on the participants. They increased their knowledge of the species, monitoring and recognition of what is citizen science.

3.1.2. Observations shared in I-naturalist

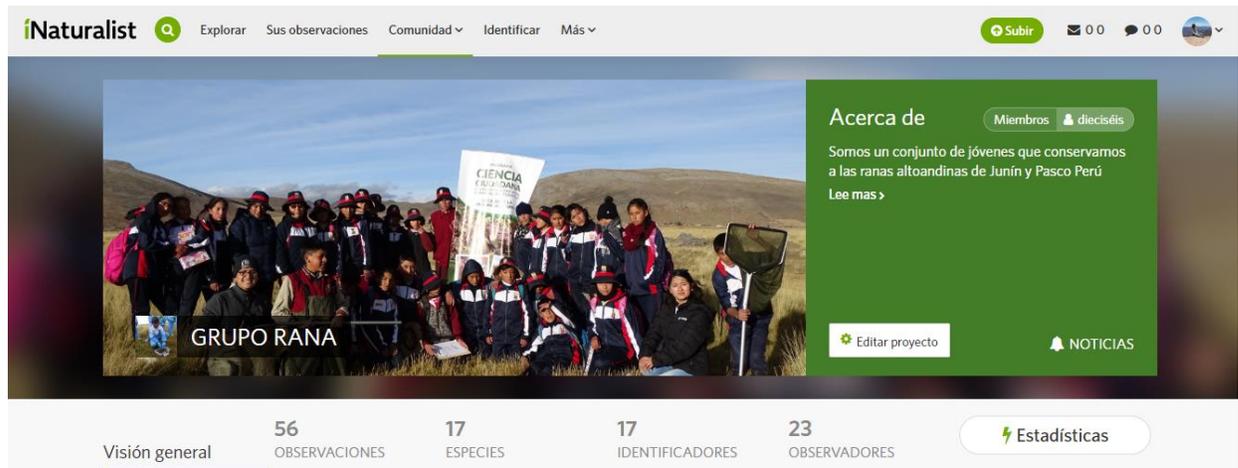


Figure 8. Project in I-naturalist

Within the context of the project, only a minority of the students had smartphones with internet access and camera, so this platform was not widely developed in the project.

3.1.3. Parades and report on national television to promote the conservation of frogs

This activity emerged as an initiative to publicize the project, so it was not part of the original concept, but in its development, the students of the educational institution Jorge Chavez Dartnell, along with members of Grupo RANA, teachers and some parents planned a "pasa calle", a small parade with banners made by the students sharing information they learned about the frogs and the threats they experience. We toured the streets of their district of Carhuamayo, and accompanied by national press, we chanted, in one unified voice, a call for the conservation of frogs. "Let's save our frogs," "Let's save our frogs."

After that lovely experience, we went to the field to share our work in the field, with the reporter, through the eyes of the students. The press made our contribution to conservation of the Junín frogs visible nationwide (That report can be seen here <https://www.facebook.com/AgendaPasco/videos/644129332775306/?t=43>).



Figure 9. March to promote the conservation of frogs and report on national television

3.1.4. First High School BioBlitz in the Junín National Reserve

Developing a BioBlitz was not initially part of the project. We were lucky to get financing from The National Geographic Society and a BioBlitz seemed to be the perfect conclusion to all the work we had done throughout the year. It allowed us to bring home the point of the project, bring together all of the program participants at the same time in the same space. This way they could all get to know one another and share experiences and see that they were all a small part of a larger project with a shared outcome, to save the frogs of Junín. The BioBlitz, had specialists, researchers, park rangers, experts, volunteers, teachers, parents and students, who were able to

meet and interact with each other. Groups were divided into teams searching for the seven taxonomic teams; birds, mammals, amphibians, fish, aquatic macroinvertebrates, insects, and flora.



Figure 10. Student participants in the citizen science program at the BioBlitz.

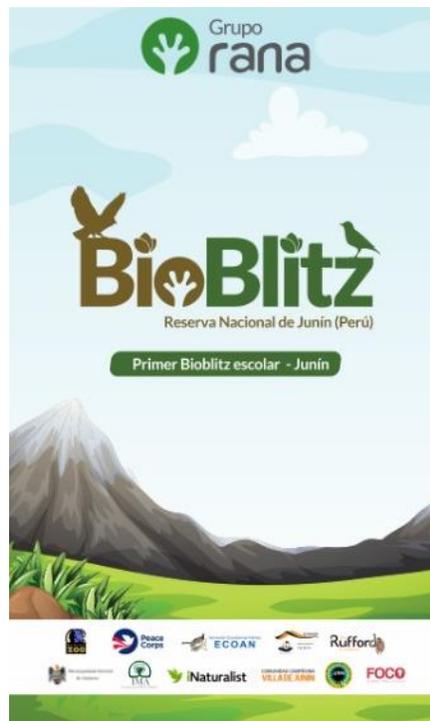


Figure 11. BioBlitz Banner

3.1.5. Awards and Interest in continuing to develop Citizen Science

Once the program was finished, two educational institutions were awarded prizes, for their performance, commitment and involvement in the project. Two high schools stood out and were awarded, the first-place prize went to Jorge Chavez Dartnell High School. They were awarded a GPS and a net. Second place went to 6th of August High School and they were awarded a pair of waders and a net. The award presentation at both schools was recorded in the minutes. (annexed 2 and 3).



Figure 12. Award to educational institutions, first and second place

Also, after completing this program, some educational institutions sent us their interest to continue developing the program (annexed 4). There were some meetings to discuss

decisions regarding the following school year. We are all enthusiastic and eager to continue developing this project in 2020.

3.2. Cleaning of canals in the ranching community of Ondores

Of the 11 ranching communities around the Junín National Reserve, the town of Ondores was selected to develop a plan around the cleaning of canals. It was chosen due to the fact that Ondores is the only location around Lake Junín where both species of frogs, *T. macrostomus* y *T. brachydactylus*, are found. *This information was shared in the results of the study, "Exploration in search of endangered frog species (Telmatobius macrostomus y Telmatobius brachydactylus) in sites where they have historically been found" executed by NGO Grupo RANA and financed by The National Geographic Society.*

Canals cleaning is a stressor that alters the frog habitat (Watson et al., 2016), members of the ranching community of Ondores were accompanied, in the cleaning of channels. Interviews were conducted, in order to understand the frequency, duration and process involved in the activity and the frequency of encounters with frogs during the process, from the perspective of the local citizens. Then, based on the gathered information, three workshops were designed to share the current situation of the frogs of Junín and how they are affected by the cleaning of canals.

In the end, we found that in our last accompaniment that the community members applied the initiatives that they had proposed in the workshops, they no longer left solid waste during the process and they released the tadpoles they found instead of capturing them.



Figure 13. Workshops and accompaniment in cleaning of canals in the ranching community of Ondores

3.3. Interpretive panels for guests

Two travelling interpretive infographic panels were designed and installed in the interpretation centers of the Junín National Reserve (annexed 1), each panel has information on the situation of the local amphibians, their diet, threats and natural habitats. It is available for visitors, so that they can learn a little more about the frogs of Junín. The park rangers were trained to share the contents of the panels and administer a simple survey of five questions, to gauge the understanding of the visitors on the information provided on the panels. With three or more questions answered correctly by those guests, it is considered an effective interpretive technique (approved on the graph), otherwise it would be considered unsuccessful (disapproved on the graph). So far, around 100 visitors, both in the interpretation centers of Ondores and Huayre, have been surveyed and the percentages of success are greater than the percentages for unsuccessful (figure 14).

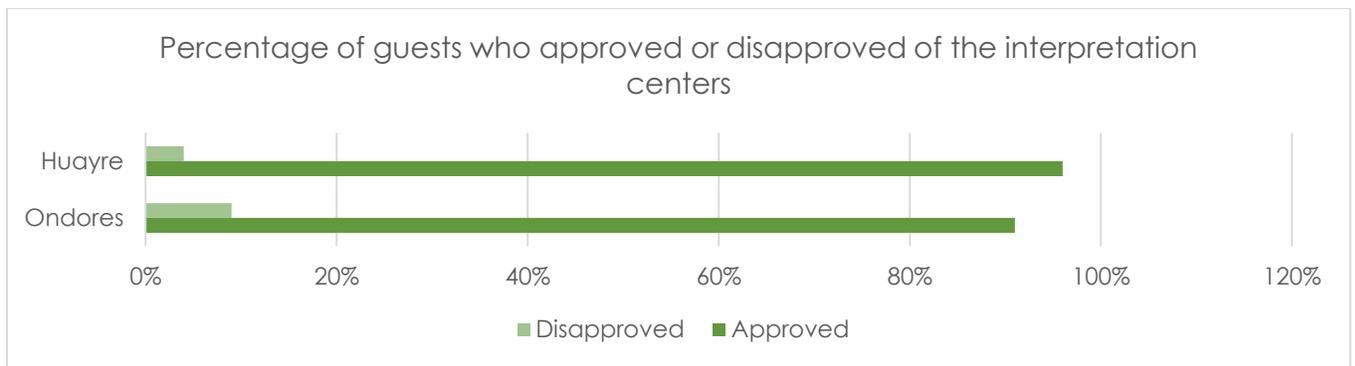


Figure 14. Percentage of guests who found the display successful versus unsuccessful



Figure 15. Delivery of travelling interpretive panels

3.4. Results and sharing of experiences

The progress of the project was shared in the open forum opportunities during the meeting of The Environmental Management Committee of Lake Chinchaycocha, where private institutions, civil society, representatives of communities, NGOs, local authorities and others are welcome to participate. In addition, we shared our results through other avenues to reach even more of the public, such as, radio stations, television programs, the Biregional Plenary of Chinchaycocha, communal assemblies, the festival of The Anniversary of the Battle of Junín in the Historic Sanctuary of Chacamarca (another natural area protected by the government of Peru, where *T. macrostomus* is also found), local "Eureka" science and technology fairs at the schools, and others.

The experiences at the interregional level were shared in an "exchanging of experiences", thanks to Denver ZOO financing. With their help we were able to share our experiences in Puno, where *Telmatobius culeus* (giant frog of Titicaca) is found. We presented at the seminar "Conservation of High Andean Amphibians: Perspectives in Environmental, Science Education, and Approach to Forest and Wildlife Legislation".



Figure 16. Sharing of experiences in different spaces



Figure 17. Exchange of experiences in Puno

3.5. Infographics in Social Media

We seek to reach the non-local public, which we divided into four different approaches; general public to educate and raise awareness about the frogs of Junín, conservationists and researchers, national entrepreneurs and donors who support our cause. The content of each infographic was prepared with scientific and factual information. In figure 18, a histogram is shown that shows that we had a reach of more than forty thousand people that were reached.

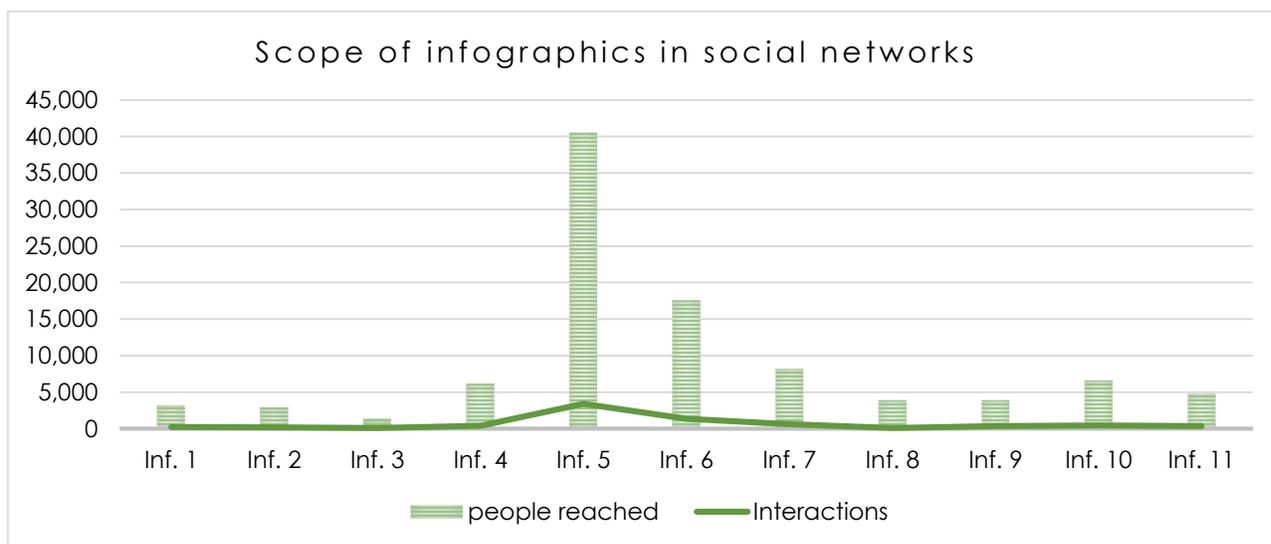


Figure 18. Histogram of people reached, and interactions achieved in social media
Source: compiled from <https://www.facebook.com/gruporana/> November 2019

www.gruporana.org

¿QUE NOS PREOCUPA?

Según las Investigaciones de WWF (World Wide Fund) desde 1970 al 2014 la abundancia de las poblaciones de mamíferos, aves, peces, reptiles y anfibios disminuyó en un 60% en el mundo.

Hemos perdido más de la mitad de los animales del planeta desde 1970.

FUENTE: WWF 2015, Informe Planeta Vivo - 2015. Apartado más alto. Croxen, M. y Almynd, R.E.A. 2016. WWF. Glaxo Sabis.

Rufford

www.gruporana.org

¿QUE NOS PREOCUPA?

Los ecosistemas de agua son los más amenazados.

En América del Sur y Central sucedieron las mayores disminuciones en las poblaciones de animales de agua dulce (-94%), especialmente de reptiles, anfibios y en peces.

FUENTE: WWF 2015, Informe Planeta Vivo - 2015. Apartado más alto. Croxen, M. y Almynd, R.E.A. 2016. WWF. Glaxo Sabis.

Rufford

www.gruporana.org

DIFERENCIAS ENTRE SAPO Y RANA

Sapo - *Bufo sp.* / Rana - *Rana sp.*

Piel generalmente rugosa
Cuerpo rechoncho
Extremidades cortas
Hábita fundamentalmente terrestres
SAPO
Cuerpo estilizado
Piel lisa con pocas granulaciones
RANA
Mayores adaptaciones para la vida acuática
Extremidades largas

FUENTE: López S. et al. 2013. Anfibios en Chile, un desafío para la Conservación. Ministerio del Medio Ambiente.

Rufford

www.gruporana.org

¿CUANTOS ANFIBIOS HAY EN EL PERÚ?

En Perú se han estimado un total de 622 especies de anfibios, comprendidos en 3 órdenes (Anura, Caudata y Gymnophiona).

El orden Anura (sapos y ranas) posee el mayor número de especies (602 especies, 97.10%).

FUENTE: División Académica de Ciencias de Anfibios y Reptiles del Perú. Plan de Manejo de la Reserva de Biosfera de Manu, 2013.

Rufford

www.gruporana.org

ENFERMEDAD LETAL SIN PRECEDENTES "La Quitridiomycosis"

La enfermedad ha sido culpable de la extinción de 90 especies de anfibios durante los últimos 60 años.

El tráfico internacional de animales ha contribuido a que el hongo se disemine globalmente.

Batrachochytrium dendrobatidis (Bd)

La quitridiomycosis es una enfermedad causada por el hongo patógeno *Batrachochytrium dendrobatidis* (Bd).
Dr. Alex Hyatt, CSIRO

Rana muscosa, infectada por el mortal hongo.
Foto: Dr. Vance T. Vredenburg

FUENTE: 2002 News Release. 29 de Mayo de 2010. La enfermedad letal de presciencia que está extinguiendo a los anfibios en más de 60 países. Oficina de Relaciones Públicas de la Universidad de California, San Diego. <http://www.scripps.edu/newsroom/newsroom.cfm?id=4773&id=4>

Rufford

www.gruporana.org

LAS RANAS GIGANTES DE JUNÍN

Estas ranas fueron encontradas en tres Áreas Naturales Protegidas del Perú que garantizan su conservación, estas son:

Santuario Histórico de Chacamarca
Reserva Nacional de Junín
Santuario Nacional de Huayllay

FUENTE: Wilton, A. S., A. L. Fitzinger, O. J. Domínguez Baldoín, R. K. Fries. 2017. Habitat characteristics, occupancy and extinction probability of the Endangered and endemic giant frog *Leptodactylus fimbriatus*. *Endangered Species Research*, 32: 424-436.

Rufford

www.gruporana.org

¿SABÍAS DE QUÉ SE ALIMENTAN LAS RANAS?

Las ranas son carnívoras, lo que significa que comen otras criaturas.

Se alimentan de invertebrados como: caracoles, babosas, orugas, gusanos así como de moscas y polillas.

Los pequeños renacuajos comen algas y detritus.

FUENTE: Wilton, A. S. et al. 2017. What do frogs eat? <http://www.rufford.org.uk/news/what-do-frogs-eat>

Rufford

www.gruporana.org

¿QUE NOS PREOCUPA?

En nuestra región la situación es la más preocupante, perdimos el 89% de los vertebrados desde 1970.

Es decir que en América del Sur y Central se estima que de 10 animales de una población de 1970 solo quedó 1 para el 2014.

FUENTE: WWF 2015, Informe Planeta Vivo - 2015. Apartado más alto. Croxen, M. y Almynd, R.E.A. 2016. WWF. Glaxo Sabis.

Rufford

www.gruporana.org

¿CUÁNTAS ESPECIES DE ANFIBIOS HAY EN EL PERÚ?

En Perú se han estimado un total de 637 especies de anfibios, comprendidos en 3 órdenes (Anura, Caudata y Gymnophiona).

El orden Anura (sapos y ranas) posee el mayor número de especies (618).

FUENTE: <http://www.rufford.org.uk/news/what-do-frogs-eat>

Rufford

www.gruporana.org

¿CUÁLES SON LAS PRINCIPALES AMENAZAS DE LOS ANFIBIOS?

Modificaciones y fragmentación del hábitat
La sobreexplotación y el comercio de anfibios
Contaminación ambiental
La quitridiomycosis
Cambio Climático
Especies introducidas

FUENTE: Cordeiro, A. E. et al. 2015. Estado de conservación de los anfibios en Perú. Oficina de Investigación Científica y Tecnológica. <http://www.rufford.org.uk/news/what-do-frogs-eat>

Rufford

www.gruporana.org

En el mundo existen 7068 especies de ranas y sapos

Estas especies se diferencian unas de otras por sus genes y sus características externas (forma, color, tamaño y otros).

Lo más probable es que si tenemos dos individuos con patrones de colores distintos sean especies diferentes.

FUENTE: www.amphibians.org del 21 de mayo de 2019.

Rufford

Figure 19. Infographics published on social media networks

Lessons learned

- As this is a new and innovative proposal, it was necessary to redesign the strategies in order to make the proposal more attractive to the participants, therefore, the strategies established in the project formulation were modified from inception to presentation.
- Engaging the local population throughout the implementation of the project and through different activities allowed them to identify with project with and give the project greater attention, not only do we refer to the project participants, but also to the public, as well.
- Identifying a group of cooperating allies with the project is essential, since we are not the only ones interested in frog conservation, but also local authorities, NGOs, civil society, among others. Engaging all of them in the project, allows them to strengthen our results and the contributions they gave us were invaluable when developing the activities.
- Involving the local population throughout the development of the project through different activities allows them to identify with the project and give it greater focus. Again, we refer to both the project participants and general public, as well.
- Linking different activities not originally contemplated, but that emerged throughout the development of the project were fundamental, since they allow magnify the achievements and engage more people in the project.
- It is necessary to have a motivated team, that shares feedback and open communication at each stage of the project; with collaborators who deliver on their assigned and shared responsibilities. Also, it is necessary to involve experts related to the conservation work of the amphibians and/or their ecosystems, in order to motivate and expand the network of contacts of the entire team.
- Ensure that the team that shares the project, this not only refers to the project implementers, but also the participants, the park rangers, volunteers, field assistants, advisors and others.

Conclusions

- A citizen science network was created in the province of Junín with a special focus on 153 students and 10 local teachers, who were part of a program that provided six learning sessions both theoretical and practical, which increased the participants' knowledge in relation to the program and contributed valuable data about both *T. macrostomus* and *T. brachydactylus*, to science.
- We were able to develop more activities than previously planned, so that the participants of the citizen science program were part of the First Junín National Reserve High School BioBlitz, funded by The National Geographic, an opportunity that allowed all the project participants to meet, exchange experiences and knowledge, and understand that they were part of a much larger process.
- There is a close relationship with more than 22 allies at local and non-local level, among them NGOs, public institutions, authorities, universities, civil society and others, many of whom have a strong interest in continuing to support the project in future stages.
- Three workshops were held with the ranching community of Ondores and two accompaniments (outings) to understand the efforts to clean the canals. Through these accompaniments the perspective of the community members regarding the activity was appreciated and therefore a more responsible cleaning of the canals was developed and shared.
- The results and experiences were shared continuously in different open forum opportunities, and through these opportunities, the project and its scope were shared with the local population, attracting their attention and engaging them in the project.
- Two travelling interpretive panels were designed and installed at the two Interpretation Centers at the Lake Junín National Reserve. They feature information on the situation of the frogs of Junín and the threats they face. These panels are explained to guests, by the SERNANP park rangers, in order to increase guest knowledge in relation to frogs within the Junín National Reserve.
- The infographics shared on social media reached more than 40,000 people. This allowed us to reach more public, and we were able to present the current situation of

the frogs of Junín and to raise awareness for their plight. This was also a way for the public to share the experiences of the project.

Bibliography

AmphibiaWeb. (2019). Search the Database. Retrieved from https://amphibiaweb.org/cgi/amphib_query?rel-common_name=like&rel-family>equals&rel-ordr>equals&rel-intro_isocc=like&rel-description=like&rel-distribution=like&rel-life_history=like&rel-trends_and_threats=like&rel-relation_to_humans=like&rel-comments=like

Barrionuevo, J. S. (2016). Frogs at the summits: phylogeny of the Andean frogs of the genus *Telmatobius* (Anura, Telmatobiidae) based on phenotypic characters. *Cladistics*, (Buenos Aires), 1–28.

Castillo, L. (2017). Preferencia de microhábitat del renacuajo de *Telmatobius macrostomus* (Peters 1873) “ rana gigante de Junín ” en los afluentes del lago Chinchaycocha , Junín , Perú.

Freda, J., & Dunson, A. (1984). Field and Laboratory Studies of Ion Balance and Growth Rates of Ranid Tadpoles Chronically Exposed to low pH. *Physiological Zoology*, 57(4) (435–43).

INRENA. (2008). Reserva Nacional de Junín Plan Maestro / 2008 -2012. 1–273.

IUCN. (2019). IUCN. The IUCN Red List of Threatened Species. Retrieved from IUCN website: <https://www.iucnredlist.org/search?query=telmatobius&searchType=species>

Puerta-Piñero, C., Gullison, R. E., & Condit, R. S. (2014). Metodologías para el Sistema de Monitoreo de la Diversidad Biológica de Panamá. <https://doi.org/http://dx.doi.org/10.5479/si.ctfs.0001>

Watson, A. S., Fitzgerald, A. L., Baldeón, O. J. D., & Elías, R. K. (2017). Habitat characterization, occupancy and detection probability of the Endangered and endemic Junín giant frog *Telmatobius macrostomus*. *Endangered Species Research*, 32(1), 429–436. <https://doi.org/10.3354/esr00821>

Watson, A. S., Fitzgerald, A. L., Damián-Baldeón, O. J., Chamorro, A., & Roque, C. (2016). Ranas Altoandinas en la Región de Junín : Estado Actual y Plan Estratégico de Conservación. ResearchGate, (November). <https://doi.org/10.13140/RG.2.2.16588.31365>

Wiederhold, B. K., Riva, G., & Graffigna, G. (2013). White paper on Citizen Science for Europe. *Annual Review of CyberTherapy and Telemedicine*, 11, 7. <https://doi.org/10.2307/25305584>

Annexes



ACTA DE ENTREGA

La ONG Grupo RANA en reconocimiento al compromiso e involucramiento demostrado por el SERNANP a través de la Reserva Nacional de Junín, durante su colaboración en la "Iniciativa de conservación de anfibios altoandinos de la cuenca del lago Junín" ha decidido otorgar para su gestión y mantenimiento, lo siguiente:

| Ítem | Cantidad | Detalle |
|------|----------|---------------------|
| 1 | 2 | Paneles Itinerantes |

De modo que los visitantes y los residentes locales puedan conocer la situación de las ranas de Junín con información actualizada para el desarrollo de la educación en los centros de interpretación de Ondores y Huayre, y ferias.

La presente entrega es gracias al financiamiento de The Rufford Foundation.

Para constancia se firma en la reunión del Comité de Gestión de la Reserva Nacional de Junín. Siendo las 13:30 horas a los 18 días de octubre de 2019.

Junín, octubre de 2019


Ing. Oscar Jesús Damián Baldeón
Director de Proyectos
ONG Grupo RANA

MINISTERIO DEL AMBIENTE
Reserva Nacional de Areas Naturales Protegidas
SERNANP

Blgo. MAYKOL RODRIGUEZ ZEGARRA
JEFE

Blgo. Maykol Rodríguez Zegarra
Jefe Reserva Nacional de Junín
SERNANP

ACTA DE PREMIACIÓN

La ONG Grupo RANA en reconocimiento al compromiso e involucramiento demostrado por la institución educativa "6 de Agosto" ubicada en Jirón Mariano Necochea 350, distrito Junín, provincia Junín; durante su participación en el "PROGRAMA DE CIENCIA CIUDADANA CENTRADO EN LA EDUCACIÓN AMBIENTAL PARA LA CONSERVACIÓN DE ANFIBIOS ALTOANDINOS (*Telmatobius macrostomus* y *Telmatobius brachydactylus*) EN ESTUDIANTES LOCALES DE LA PROVINCIA DE JUNÍN" ha decidido premiarlos con un wader pantalón de pesca con botas impermeable y una red de pesca plegable con aterrizaje, con la finalidad de que sean empleados por los docentes y estudiantes de la institución educativa, en su proceso de aprendizaje y para llevar a cabo proyectos de monitoreo e investigación.

La ONG hará visitas no programadas a la institución educativa para verificar que los equipos otorgados estén siendo utilizados para ello precisará de evidencias, tales como fotografía o fichas, en caso de no se evidencie el uso de los equipos por parte de la institución educativa, la ONG procederá a recuperarlos.

Los equipos son entregados gracias al financiamiento de The Rufford Foundation. A continuación, se enuncian las características de los mismos:

| Ítem | Cantidad | Detalle |
|------|----------|---|
| 1 | 1 | Wader Pantalón De Pesca Con Botas Impermeable Características: - Marca Matsue Since 1980 - Impermeable - Con uniones termoselladas - Bolsillo interno - Interior suave y transpirable - Talla (estandar) - Color verde petróleo |
| 2 | 1 | Red de pesca plegable con aterrizaje Características: - Marca MADBITE Madly different - Longitud total 115 cm - Mango de aluminio de 51 cm de longitud - Longitud total de la malla 51 cm * 51 cm * 41 cm - Tamaño de aro 1 cm - Color negro - Estuche negro para la red |

Para constancia se firma en la Institución Educativa "6 de Agosto". Siendo las 12:00 horas a los 29 días de noviembre de 2019.

Junín, 29 de noviembre del año 2019



Ing. Oscar Jesús Damián Baldeón
 Director de Proyectos
 ONG Grupo RANA



Mg. Hilda Isabel Cairampoma
 Mendoza
 Directora
 I.E. 6 DE AGOSTO



ACTA DE PREMIACIÓN

La ONG Grupo RANA en reconocimiento al compromiso e involucramiento demostrado por la institución educativa "Jorge Chávez Dartnell" ubicada en Jr. Torres Menendez S/N, distrito Carhuamayo, provincia Junín; durante su participación en el "PROGRAMA DE CIENCIA CIUDADANA CENTRADO EN LA EDUCACIÓN AMBIENTAL PARA LA CONSERVACIÓN DE ANFIBIOS ALTOANDINOS (*Telmatobius macrostomus* y *Telmatobius brachydactylus*) EN ESTUDIANTES LOCALES DE LA PROVINCIA DE JUNÍN" ha decidido premiarlos con un GPS y una red de arrastre, con la finalidad de que sean empleados por los docentes y estudiantes de la institución educativa, en su proceso de aprendizaje y para llevar a cabo proyectos de monitoreo e investigación.

La ONG hará visitas no programadas a la institución educativa para verificar que los equipos otorgados estén siendo utilizados para ello precisará de evidencias, tales como fotografía o fichas, en caso de no se evidencie el uso de los equipos por parte de la institución educativa, la ONG procederá a recuperarlos.

Los equipos son entregados gracias al financiamiento de The Rufford Foundation. A continuación, se enuncian las características de los mismos:

| Ítem | Cantidad | Detalle |
|------|----------|---|
| 1 | 1 | GPS Características: <ul style="list-style-type: none"> - M/N: ETREX 10 GARMIN - CAN ICES-3(B)/NMB-3(B) - s/n53D261361 - Pantalla monocroma de 2.2" - Receptor GPS de alta sensibilidad compatible con WAAS - Admite geocaching "sin papeles" - Interfaz USB - Diseño Resistente - Clasificación de resistencia al agua IPX7 - Funciona con dos pilas AA |
| 2 | 1 | Red de Arrastre – Muestreador de peces Características: <ul style="list-style-type: none"> - Mango de aluminio - Radio de mango - Radio de mango 2 cm - Granulometría de malla 0.5 cm |

Para constancia se firma en la Institución Educativa "Jorge Chavez Dartnell". Siendo las 8:00 horas a los 26 días de noviembre de 2019.

Junín, 26 de noviembre del año 2019

Ing. Oscar Jesús Damián Baldeón
 Director de Proyectos
 ONG Grupo RANA

Mag. Raul José Oscanoa Alania
 Director
 I.E. Jorge Chávez Dartnell



MINISTERIO DE EDUCACIÓN
DIRECCIÓN REGIONAL DE EDUCACIÓN DE JUNÍN
UNIDAD DE GESTIÓN EDUCATIVA LOCAL DE JUNÍN
J.E. "Jorge Chávez Dartnell"

"Año de la Lucha Contra la Corrupción y la Impunidad"

Carhuamayo, 05 de diciembre de 2019

OFICIO N° **0376**-2019-D-LE-"JCHD"- Cyo.

Sr.:

Ing. Oscar Jesús DAMIÁN BALDEÓN
DIRECTOR DE PROYECTOS
ONG GRUPO RANA

PRESENTE.

ASUNTO: SOLICITO BRINDAR CAPACITACIÓN PARA CONTINUAR CON EL PROGRAMA DE CIENCIA CIUDADANA, CENTRADO EN EDUCACIÓN AMBIENTAL PARA LA CONSERVACIÓN DE *TELMATOBILUS MACROSTOMUS* Y *TELMATOBILUS BRACHYDACTYLUS* DURANTE EL 2020.

Con singular agrado me dirijo a usted para hacerle llegar un saludo fraterno a nombre de la Institución Educativa "Jorge Chávez Dartnell" del distrito de Carhuamayo.

El presente es para hacer de su conocimiento que la I.E. "Jorge Chávez Dartnell" la cual me honro en representar ha sido merecedor de un equipo GPS y de una red de arrastre como premio en el primer puesto en nuestra participación en el "Programa de Ciencia Ciudadana Centrado en educación Ambiental para la conservación de *telmatobius macrostomus* y *telmatobius brachydactylus* 2019". Nosotros mantenemos un interés profundo en continuar desarrollando este programa durante el año 2020.

En virtud de lo manifestado y conocedores de su espíritu colaborador en bien de la educación y la conservación de los recursos naturales, recorro a su distinguida persona para SOLICITARLE BRINDAR CAPACITACIÓN PARA CONTINUAR CON EL PROGRAMA DE CIENCIA CIUDADANA, CENTRADO EN EDUCACIÓN AMBIENTAL PARA LA CONSERVACIÓN DE *TELMATOBILUS MACROSTOMUS* Y *TELMATOBILUS BRACHYDACTYLUS* DURANTE EL 2020 para el día jueves 12 de diciembre a partir de las 3:00 p.m. en la reunión colegiada del área de Ciencia y Tecnología y Educación para el Trabajo el mismo que nos permitirá dar continuidad al programa y continuar desarrollando trabajos de investigación para nuestros estudiantes y docentes.

Seguro de contar con su gentil atención y aceptación al presente, me suscribo de su persona y aprovecho la ocasión para expresarle mi mejor aprecio y distinguida consideración.

Atentamente,



[Handwritten signature]
Ing. Oscar Jesús DAMIÁN BALDEÓN
DIRECTOR DE PROYECTOS
CPN 0542111130

IMPRESO
MINISTERIO DE
EDUCACIÓN

C.M. 0973188 - Jr. Torres Menéndez s/n - ☎ (064) 345185 - Carhuamayo