Lake Titicaca's Frog (Telmatobius culeus) Conservation Strategy Workshop

December 13-15, 2010
Bioscience School
Universidad Nacional del Altiplano
Puno, Peru.

Final Report

Reading, R.R., T.J. Weaver, J.R. Garcia, R. Elias Piperis, M.T. Herbert, C. Cortez, A. Muñoz, J.E. Rodríguez & Y. Matamoros (Eds.) 2011. Lake Titicaca's Frog (*Telmatobius culeus*) Conservation Strategy Workshop. December 13-15, 2011. Bioscience School, Universidad Nacional del Altiplano, Puno, Peru. Conservation Breeding Specialist Group CBSG/(SSC/IUCN) Mesoamerica.

Cover photo: *Telmatobius culeus*. Thomas J. Weaver.

A contribution by the Conservation Breeding Specialist Group (CBSG) SSC/UICN.

CBSG, SSC and UICN, promote workshops and other discussion groups for analysis and consideration of problems related to conservation, and when widely spread, reports from these meetings are deemed as exceedingly helpful.

Opinions and recommendations stated in this report reflect the discussed issues and the ideas expressed by the workshop participants, and do not necessarily reflect the opinion or viewpoint of CBSG, SSC or UICN.

Additional copies of this publication may be ordered through: IUCN/SSC Conservation Breeding Specialist Group (CBSG), 12101 Johnny Cake Ridge Road, Apple Valley, MN 55124. E-mail: office@cbsg.org Website: www.cbsg.org

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Section I

Executive summary and recommendations

Executive summary and recommendations

The amphibians' extinction crisis, happening throughout the world, is putting on the brink of extinction almost one third of the species of this order. The Denver Zoo is working in the conservation of Lake Titicaca's amphibians, with a particular focus on *Telmatobius culeus*, a species that is critically endangered, and the commercialization of which is considered illegal, both nationwide and worldwide.

Lake Titicaca's frog is the world's largest all aquatic frog. It is endemic to this lake, which is shared by Peru and Bolivia. On the Peruvian side, frogs are harvested and transported to markets in Lima, Cusco, Arequipa, Chile and Bolivia, where they are consumed as a juice or frog extract, as an exotic dish, as canned food, and as flour. It is claimed to have medicinal properties; therefore, it is used for a number of diseases such as bronchitis and asthma. It is also said to increase mental lucidity and virility. Salesmen travel to the lakeshore and buy the frogs from empoverished fishermen, who are induced to harvest the frogs and sell them at a very low price. It is estimated that this behavior has caused a decrease in the population of up to 80% in the last three generations. But this is not the only threat they are facing. Also, the loss of their habitat, invasive species, and global warming have affected them. Therefore, they may be predisposed to a chytridiomycosis epidemics' risk.

The Denver Zoo has been committed, through its conservation program, to establishing a program that is to include field work, captivity handling, and environmental education about this species, in order to get biological, habitat, and social and economic information of Lake Titicaca's shoreline inhabitants, and to establish the bases for conservation of this species. With this aim, a workshop was promoted and held from December 13-15, 2010, at the Bioscience School of Universidad Nacional del Altiplano, in Puno, Peru. This workshop was actively attended by 39 people representing 15 institutions and organizations of Peru, Bolivia, the United States, and Costa Rica. The workshop was facilitated by Yolanda Matamoros of the Conservation Breeding Specialist Group, of the Species Survival Commission of UICN.

The Workshop began on Monday, December 13, at 8:00 am, with a welcome speech by Matt Herbert and Richard Reading from the Denver Zoo. Participants were later presented. During the morning hours, the following presentations were made: "Lake Titicaca's Frog Conservation Project (*Telmatobius culeus*) in Peru", "Bolivian Amphibian Initiative and Lake Titicaca's giant frog", and "An Evaluation of the threats and state of conservation of Lake Titicaca's aquatic frog, *Telmatobius culeus* (Anura: Ceratophydae) in Bolivia".

In the evening, Yolanda Matamoros presented the work plan, and five work teams were created to cover the following topics: (1) To engage and raise population's awareness, (2) captivity breeding, (3) Strategic alliances, (4) Risk mitigation, and (5) In situ research. Also, a group of participants undertook the task of analyzing the answers to the question: What should be the ideal condition of the *Telmatobius culeus* populations within the next 25 years?, and from that analysis she set the conservation strategy VISION:

TO PRESERVE THE SPECIES BY MAINTAINING SUSTAINABLE POPULATIONS IN SITU AND EX SITU WITH A FREE-OF-RISK HABITAT, AND ENGAGING LOCAL POPULATIONS IN ALL INSTANCES TO ACHIEVE A TRUE LOCAL AWARENESS.

Team work began by identifying barriers or problems to be faced in order to achieve the vision, and these were subsequently presented and discussed in a plenary meeting.

On Tuesday, December 14, a video titled "The legend of Lake Titicaca" by Jacques Cousteau, was presented, and a presentation was made titled "Trophic Ecology of *Telmatobius culeus*' larvae and adult population". Subsequently, work teams identified the goals needed to eliminate the identified barriers/problems which were presented in a plenary meeting. In the evening, teamwork was again conducted to establish guidelines to reach the proposed goals.

Each group made a report on the work that was performed, thus establishing a Conservation Strategy for this species. The participants and the institutions they represent will be charged with carrying out the same.

Group 1, which analyzed the topic "To engage, and raise population's awareness", defined the following problems: failure to recognize the problem by the local population and other social actors; social and economic level and limited communication between institutions and communities. They proposed four goals and eight actions to solve or mitigate them.

Group 2 analyzed the topic "Captivity breeding", finding the following problems which prevent the achievement of the vision: lack of an adequate taxonomic revision; lack of information about Natural History of the species (habitat, reproduction, bioecology, ethology, food, nutrition, and demographics); lack of breeding experience of the captivity species, and a limited exchange of experiences and scientific information related to captivity breeding; lack of training, restricted economic support and technology; lack of protocols for captivity breeding (quarantine, handling, health, necropsy); difficulty in the procedures and permits for captivity breeding; failure to know the origin of captivity individuals, and problems with the possible taming of the species. Ten goals and twenty actions were proposed to mitigate/solve these problems and achieve the proposed vision.

Group 3, "Strategic Alliances", formulated the following problems: lack of coordination with public and private entities at a local, domestic and international level; lack of support to institutions engaged in the research of species; there is a lack of teams at the different levels of society: teams of pre-school, elementary education and high school students, team of Lake Titicaca's shoreline communities, team of professionals, team of university students and others, working for the same goal, namely, the conservation of the giant frog; lack of interest, and poor diffusion by institutions and persons belonging to the media: radio, television, magazines and newspapers. This group established four goals and 13 actions to mitigate/solve these problems and achieve the proposed vision.

Group 4, “Risk Mitigation”, analyzed the following problems: irrational extraction of the species (Lake Titicaca’s frog); pollution of the species’ habitat; deterioration of the species’ habitat, and limited conservation culture. In order to solve/mitigate these problems, four goals and 16 actions were proposed.

Group 5, “In situ research”, developed the following problems: lack of support by the government (central, regional, and local) because there are no policies for research, and there are too many bureaucratic steps; poor scientific development in the region due to a lack of economic resources assigned by the regional government (lack of training, lack of equipment and infrastructure); lack of trust and collaboration by the locals due to problems of communication and failure to recognize the goals of the species’ conservation program; lack of information on the species (lack of difussion and publications of research works). In order to solve/mitigate them, eight goals and 11 actions were proposed.

On Wednesday 15, a presentation was made titled “The toad in the Andean social cosmovision”. Later, teamwork continued. The workshop was closed at 5:00 pm.
The following are the recommendations given by the groups:

- To avoid work overlap and to unify criteria; for instance, the education and diffusion component.

-A greater diffusion of research works about the species made by Universidad Nacional del Altiplano and Universidad Peruana Cayetano Heredia, other institutions or persons.

-To establish a strategic alliance between institutions that keep the species in captivity and institutions performing captures.

- To create a temporary custody area in the city of Puno with appropriate facilities and trained staff.

- To organize breeding modules in representative places of Lake Titicaca.

-To establish the zoning of areas for recovery of the species.

- To use the lab of Universidad Nacional del Altiplano in Puno, Peru, for diagnosis of Batrachochytrium dendrobatidis fungus in captured individual frogs of Lake Titicaca, through the PCR method.

-To maintain the liaison among institutions committed to the plan.

- To create strategic alliances among institutions related to conservation of resources and environmental pollution problems (public and private).
- To establish contact with the Regional Government

- To promote regulation and establishment of municipal regulations for control of the total number of contaminating automobiles.

- To coordinate with the Executive and Legislative Powers to prevent pollution caused by hydrocarbons in Lake Titicaca.

- To improve interinstitutional coordination among the local and regional government, PELT, SERNANP, MINAG, Universities, etc.

- To make permanent follow-up of procedures of documents aimed at seeking agreements, financing, technical support, and others with the corresponding entities.

- To remain with a strong will before all challenges that may arise during the execution of the plan.
- To make a monthly assessment of the progress achieved.

-To set up a team of specialists in order to undertake participative research.

- To secure budgets and logistic material to implement the performance of surveys.
- To train agricultural workers in order to foster ecologically sustainable agricultural systems.

- Training of Totoral users for better handling of the same.

- To implement strategies on formal and informal environmental education in the face of global warming.

-To coordinate with the National Reserve for implementation of poaching prohibition seasons.

- To undertake the study of the Andean cosmovision of the Telmatobius culeus species.

- It may be different in Bolivia; therefore, it is important to involve other key actors who must undergo this process or perform the same workshop on the Bolivian side in order for authorities and persons involved to become identified with their own reality.

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Section II

Developed Schedule

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Developed Schedule

Monday December 13

8:00 a.m.	Registration of participants.
8:30 a.m.	Welcome.
9:00 a.m.	Presentation of participants.
9:30 a.m.	Presentation: Lake Titicaca's frog (Telmatobius culeus) Conservation Project in Peru. Matt Herbert- Denver Zoo, Lizette Bermúdez & Doris Rodríguez- Huachipa Zoo Park.
10:30 a.m.	Coffee.
11:00 a.m.	Presentation: Bolivian amphibian initiative and Lake Titicaca's giant frog. Arturo Muñoz Saravia – Alcide d'Orbigny's Museum of Natural History, Cochabamba, Bolivia.
11:30 a.m.	Presentation: An assessment of the threats and state of conservation of Lake Titicaca's aquatic frog, Telmatobius culeus (Anura: Ceratophryidae) in Bolivia. Claudia Cortez- ARMONIA Civil Association.
12:30 p.m.	Lunch.
1:30 p.m.	Presentation of the work plan.
2:00 p.m.	Creation of work teams.
2:30 p.m.	Review of the vision. Project's Mission: Sustainable conservation and protection of Lake Titicaca's frogs and their habitat.

3:00 p.m. Team work. Identification of barriers/ problems to achieve the vision according to the work team.

4:30 p.m. Plenary meeting.

Tuesday December 14

8:00 a.m. Presentation: Video: "The Legend of Lake Titicaca". Jacques Costeau

8:30 a.m. Presentation: Trophic ecology of larvae and adult members of *Telmatobious culeus* . Richard Arpasi Alpaza – Bioscience School, Universidad Nacional del Altiplano/ECOPLAN.

9:00 a.m. Team work. To identify the goals that may solve problems/ barriers identified.

11:00 a.m. Presentation of identified goals

12:30 p.m. Lunch.

12:30 p.m. Team work. To establish actions to achieve the proposed goals.

Wednesday December 15

8:00 a.m. Presentation

8:30 a.m. Presentation: The toad in the Andean social cosmovision. Dr. Hernan A. Jove Químper – Universidad Nacional del Altiplano.

9:00 a.m. Team work.

12:30 p.m. Lunch.

1:30 p.m. Plenary meeting.

2:30 p.m. Team work. Recommendations.

4:00 p.m. Plenary meeting.

5:00 p.m. Closing ceremony.

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Section III

Personal goals of participants

What is your personal goal for this workshop? What is it that you wish to be achieved through this workshop?

To learn strategies establishing links with organizations and institutions engaged in the conservation and sustainable management of natural resources. Motivation towards conservation of Titicaca's frog.

To know the characteristics of Lake Titicaca's frog. To raise people's awareness.

To get deeply involved in wildlife care (*Telmatobius culeus*). A brigade should be created in charge with raising people's awareness about the frog's protection. It should have budgetary support.

To get to know and analyze the problems we have to protect the frog. To be able to learn and care for the frog's resources and deal with society's problems.

To gather all key people working with the species.

To develop conservation, preservation, and adequate handling policies related to this species and their habitat.

To learn more about the giant frog. I hope the giant frog will not disappear.

To know the natural history of the species in order to be able to breed them in captivity.

To know this species in their natural habitat and in captivity. To establish conservation strategies of this species in their natural habitat and in captivity.

To establish conservation strategies of this species to pass on to our children.

To make a contribution towards the conservation of Lake Titicaca's giant frog. To learn and expand my knowledge about such an important species.

To get to know more about this species of the *Telmatobius* genus. What I wish is to share ideas and tolearn.

To develop field workshops on the conservation of the Lake's native species.

To develop a management plan.

To learn on the cultivation of captivity species. To raise awareness of those attending the workshop, and cause them to be eager to participate in a similar project.

To get to know the frog for real, and learn about conservation *in situ*.

To learn all within my possibilities and later disseminate this knowledge among the people I know, and perhaps to give speeches to raise population's awareness.

Preservation of *Telmatobius* biodiversity in Lake Titicaca. To learn about captivity conservation.

To contribute to the knowledge and development of interinstitutional experiences devoted to the study of Titicaca's frog (*Telmatobius culeus*). To design a proposal for handling and breeding of the lake's fog, and to establish some research priorities.

To establish strategies for the handling of *Telmatobius culeus,* and engage in its preservation.

To get to know the problems in respect to conservation of Lake Titicaca's frog. To know the actions that are being performed in the face of this problem. To know what we expect to achieve.

To identify key people involved in works with the Lake's frog to add to the efforts in their conservation. To be able to establish strategic alliances with institutions supporting educational programs.

To establish alliances and synergies to achieve something specific for conservation of the species. To have a bi-national strategy.

To contact people and institutions working with *T. culeus*. See joint work options for conservation of *T. culeus*.

To learn more about the different projects and efforts that are being carried out for conservation of this species. Secondly, I hope to know how can I contribute according to my experiences. I wish we can determine the main causes for the extinction of the species and to establish specific and real actions for conservation of this species. To establish alliances among interested groups in order to facilitate the development of guidelines.

To make a contribution to *Telmatobius* preservation. Interaction between national and international institutions within the scope of preservation of Lake Titicaca's species.

The main goal for this workshop is to raise people's awareness and educate them, starting with children and then proceeding to engage adults.

To achieve conservation of the species in captivity through a sustainable planning and management. To get information and develop a project into the future for conservation of Titicaca's frog.

To get all stake holders together to collaborate and develop an action plan for *Telmatobius culeus*.

To be able to achieve the recovery, conservation and rational management of the species.

My goal is to gain knowledge from everyone attending the workshop. I'm new to the project and I hope to achieve a better understanding of everyone's role and how I can help as well as network.

To get to know more about Lake Titicaca's biodiversity and its surroundings.

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Section IV Contributions by participants

Contributions by participants to the workshop

- Ideas contributing to the making of a plan to broadcast natural beauty.
- Through prospects and goals of the workshop in conservation and cherishing of the frog.
- To contribute by working in caring for the *Telmatobius*, and with my experience in raising awareness in wildlife preservation. I do have experience with children in connection with raising their awareness on wildlife preservation.
- To contribute with my own opinions, ideas, and information.
- Diverse experiences in working with various educational projects.
- To contribute with ideas for a better development of the project.
- To contribute with more information for this species and bring about a little bit of reaction towards this workshop.
- To communicate my interest in learning captivity breeding, and later learn how to perform it.
- Through participation in discussions, and by providing information.
- Contributing with knowledge and experience which is not extensive on this topic.
- To contribute with ideas and plans into the future in this research field and with many inquiries.
- To contribute with the education of our communities, highlighting the significance of biodiversity.
- Through participating in the process.
- By inviting more people to attend this workshop, and thus reaching more people who may be interested.
- Contributions about the knowledge of the frog, and to engage institutions.
- By telling friends and acquaintances to attend this workshop.
- I may contribute with captivity surveys and through Zoo lab ponds. By collecting samples and dead samples (mimicry).

- Intellectual, design, planning, and management resources. The Bioscience School of Universidad Nacional del Altiplano, Puno, has multidiscipline professionals (biologists, fish technicians, technologists, environmentalists, microbiologists in DNA technology handling), in addition to some physical resources (labs, shelves, equipment).

- I may contribute with my personal experience on *Telmatobius* as to distribution and consumption.

- I may contribute by gaining conservation awareness, and extend it to students and the community.

- Experience in keeping frogs in captivity. Experiences in the educational program.

- I may contribute with all my experience, knowledge and bibliography.

- Experience, knowledge about the species, and contacts.

- To provide support in the execution of an educational program and raising awareness about the species, its condition and significance, engaging local population in their conservation.

- Diffusion and participation, and ecological activism in the preservation of *Telmatobius*.

- To contribute with ideas and questions.

- To contribute with ideas, principles, and participation to improve the level of preservation.

- Captive husbandry, propagation. Captive management of the species.

- Direct participation in the problems of the species.

- I've been helping the Denver Zoo sponsors prepare for the workshop. I will help translating, for our English speaker. I hope to contribute when we begin talking about education and social marketing.

- Through suggestions and opinions.

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Section V

Telmatobius culeus Conservation challenges

A greater challenge for conservation of the species for the next 25 years.

- Decontamination of Lake Titicaca.
- Communities understanding the problem and wanting to change their habits that may be contributing to the problem.
- Recovery through artificial production in a captivity system.
- For it not to be extracted. Captive population with genetic diversity.
- The greatest challenge is to preserve the captive population of the species.
- To educate and teach about the greatest dangers to this species.
- To apply preservation technology; a greater scientific knowledge.
- The greatest challenge is, from my viewpoint, the lack of interest by the local population, and ignoring the significance of the species for the ecosystem.
- Lack of knowledge about the species, lack of a conservation strategy, and awareness by people.
- Education, funds, maintaining alliances and collaboration by the government and communities.
- Raising awareness of, and engage the population in the conservation of the species.
- To succeed in breeding this amphibian in controlled environments, and release them in their natural environment.
- Adequate management and captive husbandry.
- To design a prototype of experimental breeding zoo to keep and preserve the Titicaca's frog. The breeding zoo should have an experimental lab for the physical-chemical study of water, for artificial reproduction tests, feeding, sanitation (fungus surveys), DNA molecular technology, and breeding environments.
- Greater scale reproduction. To become aware of the loss of germplasm in the *Telmatobius* species. Conservation of the species in a controlled population.
- Artificial reproduction of this species.

- To decrease poaching and commercialization of this species in the urban markets.
- To have a specialized and supplied lab for their husbandry. This species should not be deemed as vulnerable anymore.
- To cause the population to become sensitive so that conservation may be sustainable.
- Understanding the significance of having the species in their habitat, because if the same is commercialized and removed, it may disappear from their habitat.
- The challenge is to raise the awareness of the population in order for them to understand the significance of this species.
- Research, education, awareness and diffusion of surveys made on this species.
- To cause the population to become aware of the need to preserve this species, and also to cause it to reproduce artificially in captivity, and subsequent repopulation of the same.
- Species Survey. Lack of social commitment. Lack of institutions dedicated to captive breeding of the species.
- To consolidate and promote preservation of the species, and thus avoid its extinction.
- To change the mentality and behavior of human beings in connection with this species: harvest-contamination.
- It is a goal for everyone here to be able to preserve it.
- Trained staff, budget, and duration of the project until getting to know the biology and reproduction of *Telmatobius*. I mention this because a few years ago there was a project working on captive reproduction of *Telmatobius*. It was running smoothly, but the budget was cut, and the project stopped.
- To raise awareness on the need not to pollute Lake Titicaca in order to have a proper habit for Lake Titicaca's frog.
- A change of attitude in awareness.

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Section VI

Ideal condition of *Telmatobius culeus* populations

Ideal condition of populations within the next 25 years

- That the same keeps a balance in its ecosystem.
- Progressive increase in conservation of the species.
- The first thing to be considered is to improve and/or optimize the frog's habitat, otherwise, efforts to increase their population would be meaningless.
- If we care about now, the species will be stable. Otherwise, they will become endangered.
- To have sustainable populations, so that people from Puno, from all over Peru and the world may think that Lake Titicaca's frog is valuable, and that their habitat is protected.
- Maintenance of the habitat and individuals without overpopulation or decrease.
- The idea is that the giant frog ir cared for in those populations where they are found, so that they may not get diseases that modern medicine is unable to find a cure for.
- It is located in a natural environment that is seriously endangered, but if captive breeding and reproduction are achieved, perhaps T. culeus population may recover somehow.
- One challenge is to increase their population in 25% compared to 20 years ago.
- Repopulation of this species. *In situ* conservation. Permanent research and publication of surveys on this species.
- If we achieve our workshop's goals, it is certain that the results will be reflected in the following years, but this effort must be joint and continuous, because one workshop is not enough, but many, and at different places in Puno.
- To prevent pollution of aquatic enviroments caused by mining washout. Another challenge is to encourage a greater diffusion and environmental education on the conservation of all species living in Lake Titicaca.
- An adequate distribution and population's growth.
- That it may move out of the extinction risk scope.
- That frogs may live in their habitat without any danger.

- Estuaries formed in UNA-Puno university campus and Lake Titicaca.

- To have a sustainable biomass that is able to ensure the feasibility of the population's dynamics of the species; that at the same time their stock can be monitored, analyzed and assessed. An environmental education program must be performed for the care and preservation of Titicaca's frog (Telmatobius culeus). Through domestic captures established according to a regulation and zoo management plan of the frog, considerable stocks could be obtained. The Lake's frog may enjoy a tempting gastronomic development and, at the same time, be the cause for the development of an integrated experiential tourism.

- It would be degraded from the natural standpoint due to a lack in conservation awareness by shoreline dwellers. But if the project proposes conservation strategies, it would be possible to restablish enhanced populations.

- That frogs be able to reproduce naturally without the need to perform repopulation campaigns.

- Populations stable in number and genetics, with a human population involved in conservation practices and mitigation of lake threats (frog's habitat).

- On the rise, until deemed as stable. A species that is valued and respected by the communities.

- That at least populations remain the same or increase.

- To maintain a stable population, and participation of local population in the conservation of the species.

- Increase in the population and rational use of *Telmatobius* in breeding zoos.

- That they may have an adequate habitat without the risk of exploitation.

- An adequate habitat for their development with no impact on the population.

- Not to become extinct. A sustainable population that is handled in order to supply the demand of its consumption.

- To have germplasm banks in high Andean lakes, and that dwellers are duly evaluated and trained.

- Established wild population like it was back in 1973.

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Section VII

Vision

Vision

TO PRESERVE THE SPECIES BY KEEPING SUSTAINABLE POPULATIONS *IN SITU* AND *EX SITU*, WITH A HABITAT THAT IS FREE OF THREATS, AND ENGAGING LOCAL POPULATIONS AT ALL LEVELS FOR A TRUE LOCAL AWARENESS.

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Section VIII

Team report

Engage, and raise awareness of the population

Group 1: Engage, and raise awareness of the population

Members

Doris Rodríguez

Claudia Cortez

Grover Idme

Buenaventura Carpio

Aldo Rojas

Dante Choquehuanca

Ingrid Maldonado Jiménez

Solanhs Pinto

James García

PROBLEM 1

Failure by us and the local people to know the culture.

GOAL

To know and learn on the cultural context of communities living in Lake Titicaca's rim.

Action 1

To design cultural training strategies.

Description: The training strategy considers audiences involved (work team and the communities). For a reassessment, work will be conducted every 2 months by province (6 provinces / year), which means a constant annual monitoring, and it is continuous in the event of the work team. Call a meeting of facilitators, and select them.

Person in charge: Dante Choquehuanca, Grover Idme and Buenaventura Panclas.

Timeline: 1 year for communities.

Verification Sources: descriptive memories of workshops, polls, report, photos, list of attendance, evaluation systems.

Collaborators: Universidad Nacional del Altiplano (School of Biología, School of Sociology), community leaders, PELT, RNT, Ministry of Education (Regional Directorate of the Ministry of Education – educational centers), DENVER ZOO, Association of Fishermen, ALT.

Personnel: To train the team (biologist) and facilitators: any professional in the area of social studies (sociologist, archaelogist, anthropologist) who knows about the area.

-Training the community (revaluation): professional in the social area and local facilitators.

Costs:

-Professional in the social area: US$ 1250 per month.

-Materials and equipment: US$ 7143 per year.

-Facilitator: US$ 179 per month.

Consequences:

-Key actors of communities and the team, with knowledge of the cultural context.

-Local communities identified with their culture.

Obstacles:

-Lack of commitment by institutions and actors involved.
-Lack of interest by the communities.
-Lack of financial resources.
-Labor Impermanence.
-Lack of commitment and identification with the project.
-Facilitators who are not well trained, without transmission skills.
-Schedules with lack of synchronicity.
-Person who assumes responsibility for the funds and the project.
-Loss of funds due to mishandling.

It may be different in Bolivia, but it means to involve other key actors in Bolivia who must go through the process.

Action 2

Making a social-cultural diagnosis.

Description: It means to make a collection and systematization of the social information (social, migration, population, etc.) and cultural (customs, traditions, etc.).
Person in charge: Aldo Rojas (RARE).

Timeline: 3 months.

Verification Sources: social and cultural diagnosis document, bibliography collection, polls, and others.

Collaborators: Universidad Nacional del Altiplano (social), community leaders, PELT, National Reserve of Titicaca, INET, educational centers, ALT.

Personnel: community authorities, statistics professional, professional in the social area, assistants.

Costs: US$ 3571/ 3 months for all expenses.

Consequences: getting the final social-cultural diagnosis.

Obstacles:

-Lack of updated and available information.
-That collaborating institutes fail to comply with their commitments.
-Communities not collaborating.

PROBLEM2

Failure to know the problem by the local population and other social actors.

GOAL

To encourage a more sensitive awareness by the different local and external actors (tourists, politicians, cities, etc.), and by institutions (private and state-owned) in respect to the problems of Lake Titicaca's frog.

Action 1

To design, implement, and assess a formal and informal education program for conservation of the frog.

Description: This program should have specific sub-programs in order to work with different social actors of the community, such as children and adults, schools, tourists, universities, university students, and other actors. This program will intersect topics related to water, contamination, weather changes, conservation, and biodiversity, use of resources, cultural valorization, and others.

Persons in charge: Doris Rodriguez, Jaime Garcia, Solanhs Pinto, Aldo Rojas.

Timeline: permanent, after the second year.

Verification Sources: workshops, education documents, assessments, fotographic records, videos, reports.

Collaborators: Forest and Wildlife Directorate, Universidad Nacional del Altiplano (school of biology, education), community leaders, PELT, Titicaca's National Reserve, Ministry of Education (Regional Directorate of the Ministry of Eucation- educational centers), DENVER ZOO, Huachipa Zoo, ALTA, San Marcos University, Universidad Peruana Cayetano Heredia, RARE, Puno Province Municipality- SEDAPAL technical office, ANA, Ministry of Education, national curriculum plan and PER program.

-Personnel:

-Facilitators of Communities.

-Biologists.
-Teachers.

-Graphic Designer.

-Drawing Artist.

Costs:

-For each hired Professional: US$ 1250 per month.
-Materials and equipment: US$ 21429 to US$ 25000 per year for 6 provinces.
-Facilitator: US$ 179 per month.

Consequences:

- Communities and the education workteam work together exchanging ideas and knowledge to sensitize and raise people's awareness on the frog's problem in order to preserve it.

- Different social actors, who are informed, sensitive and aware (this involves a change in their way of thinking and their attitude) on the problem and condition of Lake Titicaca's frog.

Obstacles:

-Lack of interest and commitment by the persons involved.

-Difficulty with the language and culture.

-Lack of professionals trained in environmental education and lack of professionals available.

- Lack of financial resources for the execution of education programs incidental to each institution

- Lack of communication and interinstitutional coordination (work overlap).

Action 2

To design, implement and evaluate massive diffusion campaigns for conservation of the frog.

Description: These campaigns will strengthen the knowledge about the frog, so that it will be positioned locally and in other areas. Using different communication tools such as: mass media, billboards, leaflets, community events, festivals, and others.

Persons in Charge: Aldo Rojas and Grover Idme.

Timeline: permanent after the second year.

Verification Sources: events, reports, diffusion materials, polls, photographic record, videos.

Collaborators: Forest and Wildlife Directorate, Universidad Nacional del Altiplano (Biology, Education School), community leaders, PELT, Titicaca National Reserve, Ministry of Education (Regional Directorate of the Ministry of Education – educational centers), DENVER ZOO, Huachipa Zoo, ALT, San Marcos University, Universidad Peruana Cayetano Heredia, RARE, Puno Province Municipality – SEDAPAL technical office, ANA, Mass Media, private companies.

Personnel:

-Facilitators of communities.
-Biologists
-Teachers.
-Graphic designer.
-Drawing artist.
-Social Communicator.
-Social Professional (Sociologist).

Costs:

-For each hired professional: US$ 1250 per month.
-Materials and equipment: from US$ 21429 to US$ 25000 per year for 6 provinces.
-Facilitator: US$ 250 per month.

Consequences:

- To cause different social actors to become aware of the species' problems.

-To cause a change in behavior and attitude in different social actors in favor of the conservation of the species.

-To establish strategic alliance for the next 5 years to give continuity to the diffusion campaign, by raising financial resources to cause the campaign to be self-sustainable.

Obstacles:

-Lack of interest and commitment of those involved in the project.

- Difficulty with language and culture.

-Lack of trained professionals.

-Limited flow of financial resources for execution of diffusion campaigns.

-Lack of communication and coordination among institutions (work overlap)

-Inadequate diffusion tools.

PROBLEM 3

Social-Economic Level.

GOAL

To know, reinforce, propose, and launch economic alternatives to the frog extraction, which contribute to improve the life conditions of the local population of Lake Titicaca.

Action 1

To make a social and economic diagnosis.

Description: It means to collect and systematize social and economic information (social, migration, population, etc.) of the communities. This is to map out intervention areas in order to generate strategic alliance with other institutions to improve life quality.

Person in charge: Dante Choquehuanca.

Timeline: three months for the first year.

Verification Sources: Social and economic diagnosis document, bibliographic collection, polls, and others.

Collaborators: Universidad Nacional del Altiplano (social- economic), community leaders, PELT, Titicaca National Reserve, INEI, educational centers, ALT.

Personnel: community authorities, statistics professional, social area professional, economist professional, assistants.

Costs: US$ 3571/ 3 months for all expenses.

Consequences:

-Getting the final social-economic diagnosis.

-Identify possible strategic allies.

Obstacles:

-Lack of available updated information.
-That collaborating institutions fail to comply with their commitments
-Communities not cooperating.

Action 2

To establish strategic alliances with key identified institutions.

Description: Meetings will be held with the key institutions identified above, in order to propose, reinforce and boost the generation of economic alternatives for local communities, expressed in agreements.

Persons in charge: Dante Choquehuanca and Buenaventura Carpio.

Timeline: permanent for 5 years.

Verification Sources: agreements, minutes of meetings, reports, bibliographical record, videos.

Collaborators:

-All institutions that are prioritized and identified in the diagnosis.

-Community Authorities.

Personnel:
-Technical team.

Costs:

-Logistic expenses: US$ 1786 soles/ year.

- The support we may provide will be according to the economic strategies that are established with institutions involved.

Consequences:

- To improve the economy of the communities in the region through economic alternatives without endangering the frog's population.

-To establish and maintain good and proper relations among institutions and with communities.

Obstacles:

-Lack of interest and commitment by the parties involved.
-That economic alternatives may fail for some reason.
-Limited flow of financial resources for execution of alternatives.
-Conflicts in making and complying with established policies and regulations.
-Absence of alternative resources in the communities.
-Lack of a counterpart on our side for negotiating agreements.

PROBLEM 4

Limited communication between institutions and communities.

GOAL

To identify limitations and strengthen communication at a community level and among institutions.

Action 1

To make a survey of social networks.

Description: To develop a survey of social networks to enable us to identify limitations between institutions and communities. For that purpose, a team specialized on this topic will be hired. Some of elements will be obtained from the diagnosis performed.

Persons in charge: Nicañor Bravo and Aldo Rojas.
Timeline: first year and working together with the diagnosis team.
Verification Sources: documents, reports, photographs.
Collaborators: Universidad Nacional del Altiplano (professional in social studies), community leaders, PELT, Titicaca National Reserve, INEI, educational centers, ALT.
Personnel: community authorities, a statistics professional, a professional in social studies, an economist, assistants.

Costs:
-Logistic expenses: US$ 3571/ 3 months for all expenses.
Consequences:

-To identify limitations and communication strategies to work with institutions and communities.

Obstacles:

-To fail to properly identify limitations and communication strategies.

-Lack of collaboration by communities and institutions.

Action 2

To design and implement a communication strategy.

Description: such communication strategy will be used to strengthen and improve communication at the level of communities and among institutions. Also, it will become a tool for the work team facilitating the strategic alliances, and their work with communities, and provide the team with internal communication tools.

Person in charge: Buenaventura Carpio

Timeline: 1 year.

Verification Sources: report, events, photos.

Collaborators: Universidad Nacional del Altiplano (Biology school, Sociology school), community leaders, PELT, Titicaca National Reserve, Ministry of Education (Regional Directorate of the Ministry of Education – educational centers), DENVER ZOO, ALT

Personnel:

-Professional in social studies.

-Work team.

Costs:

For each professional of the work team: US$ 1250 per month.

-Materials, equipment, logistic: US$ 7143 soles per year.

Consequences:

-To have implemented and identified communication strategies for communities and institutions.

-To optimize communication levels interinstitutionally and among communities.

Obstacles:

-Lack of skill in implementing the strategy by the technical team.

-That communities and institutions do not become interested in the same.

-Tools that are not applicable.

-Logistic delays in communication.

Lake Titicaca's Frog (*Telmatobius culeus*) Conservation Strategy Workshop

FINAL REPORT

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Universidad Nacional del Altiplano
Puno, Peru.

December 13-15, 2010

Section IX

Group report

Captivity breeding

GROUP 2: Captivity Breeding

Members

Lizette Bermúdez

Arturo Muñoz

David Velezría

Jeremy Choque Rodríguez

Tom Weaver

Rodolfo Mesa

Deli Américo Hanco Ccopa

PROBLEM 1.

Lack of an adequate taxonomic review.

GOAL

To correctly identify the species.

Action 1

Collection of genetic samples.

Persons in charge: Thomas Weaver, Arturo Muñoz, Roberto Elías

Timeline: September 2011-September 2012.

Measurable variable: Number of collected samples ready for analysis.

Collaborators: Denver Zoo, Bolivian amphibian initiative, Alcide d'Orbigny Museum of Natural History.

Personnel and time required: 6 persons.

Costs per year: $4000.

Consequences: material available for genetic tests.

Obstacles: Permits not obtained, social problems in the area.

Action 2

Use of genetic techniques with taxonomic purposes.

Persons in charge: Thomas Weaver, Arturo Muñoz, Roberto Elías.

Timeline: January 2012 – March 2012.

Measurable variable: Number of genetic sequences.

Collaborators: Universidad Peruana Cayetano Heredia, Denver Zoo, Bolivian amphibian initiative, Alcide d'Orbigny Museum of Natural History.

Personnel and time required: two persons, three months.

Costs per year: $4000.

Consequences: correct identity of the species or the group of species in the zone.

Obstacles: Export permits.

PROBLEM 2

Lack of information on the Natural History of the species (habitat, reproduction, bioecology, ethology, food, nutrition, and demographics).

GOAL 1

To increase and consolidate Natural History information.

Action 1

Establishing a virtual library.

Persons in charge: Thomas Weaver, Arturo Muñoz, Roberto Elías, Noemi Sanca Cruz

Timeline: January 2011 – July 2016.

Measurable variable: number of publications in the virtual library.

Collaborators: Denver Zoo, Universidad Nacional del Altiplano, Alcide d'Orbigny Museum of Natural History, Durrell Wildlife Trust, Museum of Natural History (UNMSM), Ornithology and Biodiversity Center (CORBIDI).

Personnel and time required: two to six months.

Costs per year: $250.

Consequences: information accessible to specialists.

Obstacles:

An inadequate coordination, lack of access to publications or works.

Action 2

To check works already performed, and priorization of works to be performed.

Persons in charge: Thomas Weaver, Arturo Muñoz, Roberto Elías.

Timeline: January 2011 – December 2016, continued work.

Measurable variable: list of research priorities.

Collaborators: Denver Zoo, Universidad Nacional del Altiplano, Bolivian amphibian initiative, Alcide d'Orbigny Museum of Natural History, Durrel, Museum of Natural History (UNMSM), CORBIDI, Universidad Peruana Cayetano Heredia (UPCH).

Personnel and time required: two persons, six months.

Costs per year: $200.

Consequences: There will be research priorities on the species as needed.

Obstacles: not to have all of the information, lack of sufficient coordination.

Action 3

Compilation of data through field surveys.

Persons in charge: Thomas Weaver, Arturo Muñoz, Roberto Elías.

Timeline: September 2011 – September 2016.

Measurable variable: Publications in respect to the topic and reports.

Collaborators: Denver Zoo, Universidad Nacional del Altiplano, Bolivian amphibian initiative, Alcide d'Orbigny Museum of Natural History, Durrell, Universidad Peruana Cayetano Heredia.

Personnel and time required: 6 persons, 5 years.

Costs per year: $8000.

Consequences: There will be relevant information on the natural history of the species.

Obstacles: Permits not obtained, social problems in the area.

GOAL 2

To have available demographic information of the species.

Action 1

To create a matrix for compilation of data on the demographics of the species.

Persons in charge: David Velezvia, Arturo Muñoz.

Timeline: January-July 2011.

Measurable variable: Designed and operative matrix.

Collaborators: Denver Zoo, Universidad Nacional del Altiplano, Bolivian amphibian initiative, Alcide d'Orbigny Museum of Natural History, Durrell, Universidad Peruana Cayetano Heredia.

Personnel and time required: two persons, six months.

Costs per year: $500.

Consequences: To have a tool to handle updated data on the demographics of the species.

Obstacles: Lack of sufficient coordination of the work team.

Action 2

To compile and update a matrix on the demographics of the species.

Persons in charge: David Velezvia, Arturo Muñoz, Tom Weaver

Timeline: January 2011 – July 2016.

Measurable variable: Matrix filled out.

Collaborators: Denver Zoo, Universidad Nacional del Altiplano, Bolivian amphibian initiative, Alcide d'Orbigny Museum of Natural History, Durrell, Universidad Peruana Cayetano Heredia.

Personnel and time required: two persons, five years.

Costs per year: $500.

Consequences: To have a tool available to handle updated data on the demographics of the species.

Obstacles: Lack of sufficient coordination by the work team.

PROBLEM 3

Lack of experience in captivity breeding of the species and limited exchange of experiences and scientific information related to captivity breeding.

GOAL

To increase and consolidate information and captivity breeding experiences.

Action 1

To create and update a webpage related to the species.

Person in charge: Tom Weaver.

Timeline: January 2011 – July 2016.

Measurable variable: online page.

Collaborators: Denver Zoo, Huachipa Zoo Park, Bolivian amphibian initiative.

Personnel and time required: 4 persons, five years.

Costs per year: $500.

Consequences: Updated and accessible information about the species.

Obstacles: availability of data to put up on the web.

Action 2

To create a group of specialists.

Person in charge: Tom Weaver.

Timeline: January 2011 – July 2016

Measurable variable: Online page.

Collaborators: Denver Zoo, Huachipa Zoo Park, Bolivian amphibian initiative.

Personnel and time required: 4 persons, five years.

Costs per year: $500.

Consequences: updated and accessible information about the species.

Obstacles: lack of interest of the people to participate in a group.

PROBLEM 4

Lack of training

GOAL

To propose training programs

Action 1

To implement training courses.

Persons in charge: Lizette Bermúdez, Tom Weaver, Arturo Muñoz, Roberto Elías

Timeline: January 2011 – July 2016.

Measurable variable: training courses.

Collaborators: Denver Zoo, Universidad Nacional del Altiplano, Bolivian amphibian initiative, Alcide d'Orbigny Museum of Natural History, Durrell, Universidad Peruana Cayetano Heredia, Huachipa Zoo Park.

Personnel and time required: 4 persons, 5 years.

Costs per year: $10000.

Consequences: Trained personnel able to work in captivity breeding of the species.

Obstacles: Insufficient funds, specialists not present in the course.

Action 2

Professional exchange.

Persons in charge: Arturo Muñoz, Lizette Bermúdez, Tom Weaver, Roberto Elías.

Timeline: January 2011 – July 2016.

Measurable variable: persons trained in captivity breeding.

Collaborators: Denver Zoo, Universidad Nacional del Altiplano, Bolivian amphibian initiative, Alcide d'Orbigny Museum of Natural History, Universidad Peruana Cayetano Heredia, Huachipa Zoo Park.

Personnel and time required: 4 persons, 5 years.

Costs per year: (Latin America: $1500) (USA, UK, $5000).

Consequences: Trained personnel able to work in captivity breeding of the species.
Obstacles: insufficient funds.

PROBLEM 5
Restricted economic support and technology.

GOAL
To raise national and international cooperation funds.

Action 1
To create a directory of possible financing sources.
Persons in charge: Tom Weaver, Richard Reading.
Timeline: January 2011 – July 2016.
Measurable variable: Directory that is created and accessible.
Collaborators: Denver Zoo.
Personnel and time required: 3 persons for 5 years.
Costs per year: $100.
Consequences: bigger funds for captivity breeding.
Obstacles: lack of coordination of the work team.

Action 2
To apply for financings.
Persons in charge: Richard Reading, Meghan Rubinstein.
Timeline: January 2011 – July 2016.
Measurable variable: Funds obtained for the project.
Collaborators: Denver Zoo, Bolivian amphibian initiative.
Personnel and time required: 3 persons for 5 years.
Costs per year: $200.
Consequences: accessible funds to implements projects.

Obstacles: inability to apply for funds.

Action 3

To develop strategies for sustainability of the project.

Persons in charge: Lizette Bermúdez, Matt Herbert.

Timeline: January 2011 – July 2016.

Measurable variable: number of applied strategies.

Collaborators: Denver Zoo, Bolivian amphibian initiative, Huachipa Zoo Park (PZH).

Personnel and time required: 4 persons for 5 years.

Costs per year: there are no direct costs.

Consequences: Funds available for the breeding project.

Obstacles: Insufficient capital to implement.

PROBLEM 6

Lack of protocols for captivity breeding (quarantine, handling, health, necropsy)

GOAL

To develop and standardize protocols for captivity breeding of the species.

Action 1

Compilation of captivity breeding information of the species.

Persons in charge: Arturo Muñoz, Lizette Bermúdez, Tom Weaver, Roberto Elías.

Timeline: January 2011 – July 2016.

Measurable variable: Compiled information on captivity breeding.

Collaborators: Denver Zoo, Bolivian amphibian initiative, Alcide d'Orbigny Museum of Natural History, Durrell, Universidad Peruana Cayetano Heredia, Huachipa Zoo Park.

Personnel and time required: 4 persons for 5 years.

Costs per year: included in the website.

Consequences: Compiled information on captivity breeding.
Obstacles: Lack of coordination, information not accessible.

Action 2
Development of standardized manuals for captivity breeding of the species.
Persons in charge: Arturo Muñoz, Lizette Bermúdez, Tom Weaver, Roberto Elías.
Timeline: January 2011 – July 2016.
Measurable variable: Information published on captivity breeding.
Collaborators: Denver Zoo, Bolivian amphibian initiative, Alcide d'Orbigny Museum of Natural History, Durrell, Universidad Peruana Cayetano Heredia, Huachipa Zoo Park.
Personnel and time required: 4 persons for 5 years.
Costs per year: included in the website.
Consequences: captivity breeding guide accessible to interested persons.
Obstacles: Lack of coordination, information not accessible.

PROBLEM 7
Difficulty in procedures and permits for captivity breeding.

GOAL
To dynamize and speed up procedures and permits within established time frames.

Action 1
To hold meetings with competent authorities.
Persons in charge: Jessica Gálvez, Arturo Muñoz, Roberto Elías, Tom Weaver
Timeline: January 2011 – July 2016.
Measurable variable: meetings with authorities.
Collaborators: Denver Zoo, Bolivian amphibian initiative, Alcide d'Orbigny Museum of Natural History, Durrell, Universidad Peruana Cayetano Heredia, Huachipa Zoo Park, Ministry of Agriculture.

Personnel and time required: 2 persons for 5 years.

Costs per year: $700.

Consequences: meetings held, and authorities informed of the project.

Obstacles: lack of interest by authorities to attend meetings.

Action 2

To establish persons responsible to make a follow-up of documents required for permits.

Persons in charge: Arturo Muñoz, Lizette Bermúdez, Roberto Elías, David Velezvia.

Timeline: January 2011 – July 2016.

Measurable variable: persons in charge making follow-up.

Collaborators: Bolivian amphibian initiative, Alcide d'Orbigny Museum of Natural History, Universidad Peruana Cayetano Heredia, Huachipa Zoo Park.

Personnel and time required: 5 persons, 5 years.

Costs per year: $700

Consequences: constantly monitored procedure.

Obstacles: lack of time by those responsible.

PROBLEM 8

Not knowing the origin of captive individuals.

GOAL

To investigate the origin of individuals arriving for captivity.

Action

To make forms for donation receipt or capture.

Persons in charge: Jessica Gálvez, Roberto Elías.

Timeline: January 2011 – September 2011.

Measurable variable: Printed forms.

Collaborators: Bolivian amphibian initiative, Alcide d'Orbigny Museum of Natural History, Universidad Peruana Cayetano Heredia, Huachipa Zoo Park.

Personnel and time required: 4 persons, 6 months.

Costs per year: $1500.

Consequences: to have information of captured and donated individuals.

Obstacles: coordination problems.

PROBLEM 9

Problems with possible taming of the species.

GOAL

To prevent taming of the species in captivity.

Action

Follow-up of release protocols.

Persons in charge: Arturo Muñoz, Lizette Bermúdez, Tom Weaver, Roberto Elías.

Timeline: January 2011 – July 2016.

Measurable variable: Procedure data taken in the release procedure at each institution.

Collaborators: OSINFOR, Huachipa Zoo Park, Denver Zoo, Universidad Peruana Cayetano Heredia, DFFS, Durrell, Bolivian amphibian initiative.

Personnel and time required: 4 persons, 5 years.

Costs per year: $1000.

Consequences: data of release processes preventing taming.

Obstacles: that breeding information is not provided at the different centers.

Lake Titicaca's Frog (*Telmatobius culeus*) Conservation Strategy Workshop

FINAL REPORT

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Puno, Peru.

December 13-15, 2010

Section X

Group Report

Strategic Alliances

Group 3: Strategic Alliances

Members

Jhonny Rafael Coaquira Toro
Matt Hebert
Quispe Olarte Rómulo Antonino
Charca Mamani Hilver
Yamileth Jimena Quispe Cutipa
Victor Enrique Ramos Rodrigo
Elvin Dennis Coaquira Toro

PROBLEM 1
Lack of coordination with public and private entities nationwide and worldwide.

GOAL
To coordinate with public and private entities nationwide and worldwide to seek financing, technical support, authorization, and human resources in order to preserve and do research on the giant frog.

Action 1
To sign an agreement between the group for preservation of the giant frog and SERNANP (National Service of State-Protected Natural Areas), RNT (Titicaca National Reserve), MINAM (Ministry of the Environment), ATFFS (Technical Administration of Wildlife and Forests), PELT (Lake Titicaca's Special Project), ALT (Autonomous Binational Authority of Lake Titicaca's Hydric System, Desaguadero River, Lake Poopó, Coipasa Salt Flat), UNA (Universidad Nacional del Altiplano), to request for technical support.
Person in charge: ABDA Group (Bioscience Association of the Plateau).
Timeline: March to September 2011.

Measurable variable: to have signed an agreement with each institution to work together for conservation of the giant frog.

Collaborators or members of the team: giant frog conservation team, and SERNANP, RNT, MINAM, ATFFS, PELT, ALT, UNA.

Resources:

Personnel: one representative of each institution.

Time required: 6 months.

Costs: $1000.00

Consequences: to get support from public and private institutions; each institution will contribute with their experiences in conservation of the giant frog.

Obstacles: some institution may not be interested in signing the agreement, may lack budget to finance the research project, or because of political circumstances.

Action 2

To coordinate with the regional government and province municipality of Puno for financing of projects related to the topic.

Persons in charge: members of ABDA group.

Timeline: April 2011 to July 2012

Measurable variable: approved projects.

Collaborators or members of the team: Denver Zoo, UNA Puno

Resources:

Personnel: Group representatives for conservation of the giant frog of Titicaca.

Time required: 15 months.

Costs:

-Printed Material: $100.00

-Travel expenses: $1500.00

-Food: $500.00

Total: $2100.00 (two thousand one hundred US dollars).

Consequences: strengthening of programs for conservation of the giant frog.

Obstacles: delay in the answer for approval of financing projects.

Action 3

To coordinate with MINAM (Ministry of the Environment), and ATFFS and RNT (Titicaca National Reserve), for permits for study of the giant frog.

Person in charge: Jhonny Rafael Coaquira Toro

Timeline: January – June 2011

Measurable variable: To have obtained permission to conduct the survey.

Collaborators or members of the team: Giant frog conservation group.

Resources:

Personnel: Group representatives for conservation of the giant frog of Titicaca

Time required: six months.

Costs: logistic material: $100.00.

Consequences: to have obtained permision to conduct the survey.

Obstacles: delay in the granting of the permit, and restrictions that may arise for conducting the survey.

Action 4

Coordination with private entities: NGOs, Bioscience Association of the Plateau (Asociación Biocientífica del Altiplano), Denver Zoo, Huachipa Zoo Park, Armonia, to facilitate personnel and support.

Person in charge: Victor Enrique Ramos Rodrigo.

Timeline: April 2011 – September 2011.

Measurable variable: support facility.

Collaborators or team members: members of ABDA group.

Resources:

Personnel: Giant frog conservation group of Titicaca.

Time required: 6 months.

Cost:

-Printed material of procedures: $50.00.

-Topic specialists: $100.00.

Total: $150.00.

Consequences: to have personnel for conservation of the giant frog.

Obstacles: Not to get a fast response for support by the service staff.

Action 5

To coordinate ABDA group (Bioscience Association of the Plateau) to include in their research projects for the study of the giant frog.

Person in charge: Victor Enrique Ramos Rodrigo.

Timeline: June 2011 to May 2012.

Measurable variable: to achieve a favorable result in the conservation of the giant frog.

Collaborators or team members: work team and ABDA group (Bioscience Association of the Plateau).

Resources:

Personnel: ABDA group and work team of the giant frog.

Time required: 12 months.

Costs: $1000.00.

Consequences: that students become interested in studying the conservation of the giant frog.

Obstacles: Delay in the financing procedure in order for the ABDA group to be able to execute and finish the work of conservation of the giant frog.

PROBLEM 2

Lack of support to institutions engaged in the species research.

GOAL

To seek support from institutions engaged in research of this species in order to submit well established projects.

Action

To submit well established projects to enable the effective completion, and ensure good results in the conservation of the giant frog.

Person in charge: Jhonny Rafael Coaquira Toro

Timeline: April – December 2011.

Measurable variable: Approval of the project.

Collaborators or members of the team: giant frog conservation group.

Resources:

Personnel: giant frog conservation group.

Time required: 9 months.

Costs: $1000.00.

Consequences: Execution of the project.

Obstacles: Delays in procedure for approval of the project.

PROBLEM 3

There is a lack of small teams from different levels of society: students team, Lake Titicaca shoreline community team, professionals team, university students team, and others, engaged exclusively in the conservation of the giant frog.

GOAL

To create small teams from different levels of society: pre-school, elementary and high school teams, Lake Titicaca shoreline communities team, professionals team, university students team, and others, working towards the goal which is the conservation of the giant frog.

Action 1

To coordinate with persons in charge from educational institutes for conservation of the giant frog.

Person in charge: Victor Ramos Rodrigo.

Timeline: January - March 2011 (Puno Province).

Measurable variable: to provide training on the giant frog to schools.

Collaborators or members of the team: giant frog conservation group, and Engineer Carmen Teresa Torres Huanca, principal of “Nuestra Señora del Carmen” school.

Resources:

Personnel: giant frog conservation trainers.

Time required: 3 months.

Costs: $300.00, for each school.

Consequences: To create RANAS (frogs) brigades.

Obstacles: That some schools will not give permission to create the RANA brigades.

Action 2

To coordinate with presidents of communities of farmers in order to promote conservation of the giant frog.

Person in charge: Jhonny Rafael Coaquira Toro

Timeline: April-December 2011.

Measurable variable: To provide training to communities of farmers.

Collaborators or team members: giant frog conservation group.

Resources:

Personnel: giant frog conservation trainers.

Time required: 9 months.

Costs: $1000.00 (for each community of farmers).

Consequences: to create giant frog conservation teams in each shoreline community of Lake Titicaca in the Puno province.

Obstacles: Limited roads which makes access to shoreline communities difficult.

PROBLEM 4

Lack of diffusion and interest by institutions and people from the media: radio, television, magazines, and newspapers.

GOAL

To promote diffusion and interest by institutions and persons from the media: radio, television, magazines, and newspapers about research, adequate conservation methods, dangers the species is undergoing.

Action 1

To write a monthly newspaper column.

Person in charge: Yoni Rafael Coaquira Toro.

Timeline: January-December 2011.

Measurable variable: publication of the newspaper column of greatest regional diffusion.

Collaborators or team members: giant frog conservation group

Resources:

Personnel: Newspaper editor and director

Time required: 12 months (quarterly).

Costs: Newspaper publication: $600.00

Consequences: To promote interest in readers aimed at conservation of the giant frog.

Obstacles: Delay in the search for financing.

Action 2

To make an information bulletin from time to time about the frog.

Persons in charge: Yoni Rafael Coaquira Toro and Hilver Charca Mamani.

Timeline: April and May, 2011.

Measurable variable: publication of the information bulletin.

Collaborators or team members: giant frog conservation group

Resources:

Personnel: Director, graphic designer, editor, photographer, and advisers.

Time required: 12 months (quarterly).

Costs:

Making the bulletin: $900.00.

-Color printing of the bulletin (3.000): $1000.00.

-Food expenses and logistic material: $600.00.

Total: $2500.00 (two thousand five hundred US dollars).

Consequences: To inform and educate the general public.

Obstacles: Need for a greater number of bulletins for massive diffusion.

Action 3

To establish the "Frog Day" at a regional level.

Persons in charge: Denver Zoo (James Garcia and Matt Herbert) and Rómulo Quispe Olarte

Timeline: promotion: January-May 2011; the date will occur on, or in connection with the environment day (June 5); the event can take place on June 6, 2011, the Earth Day, the Day of the Wetlands, or the World Day of Amphibians (April 28).

Measurable variable: Establishing a day with activities informing the general public on the situation of amphibians, emphasizing Lake Titicaca's giant frog.

Collaborators or team members: UNA (Universidad Nacional del Altiplano), Denver Zoo, SERNANP (National Service of State-protected Natural Areas, RNT (Titicaca National Reserve), MINAM (Ministry of the Environment), ATFFS (Wildlife and Forest Technical Administration), PELT (Lake Titicaca Special Project), ALT (Autonomous Binational Authority of Lake Titicaca's Hydric System, Desaguadero River, Lake Poopó, Coipasa Salt Flat).

Resources:

Personnel: To appoint a representative of each institution.

Time required: three months.

Costs:

-Informative bulletins: $500.00.

-Course: $300.00.

-School parade: $200.00.

-Polo shirts: $2000.00.

CDs: $100.00.

Total: $3100.00 (three thousand one hundred US dollars).

Consequences: Conservation of the species in the ecosystem because of the role played by the frog in the food chain, and because it is a natural resource. Its disappearance would cause an alteration in the ecosystem.

Also, domestic and international private entities can see the work that is being performed, and thus, they may make an integration in their political system to aid in the achievement of goals.

Obstacles: lack of financial resources.

Action 4

Making a documentary video on the species.

Persons in charge: Hilver Charca Mamani (ABDA Producciones).

Timeline: August 2011 – July 2012.

Measurable variable: a one-hour documentary video.

Collaborators or team members: ABDA Group, Denver Zoo, Bioscience School of UNA – Puno.

Resources:

Personnel:

-Cameramen: charged with filming scenes.

-Editors: graphic design and documentary editing.

-Message by: DENVER ZOO

-Logistic Support Bioscience School UNA-Puno

-Support by the inhabitants of the interior bay of Lake Titicaca

-Support by IMARPE (Sea Institute of Peru) with research boat.

Time required: 12 months

Costs:

-Research and filming trips: $3000.00.

-Documentary editing: $1000.00.

-Logistic material: $2000.00.

-Procedures and documentation:$500.00.

-Food expenses: $2000.00.

-Basic equipment: $10000.00.

Total: $18500.00 (eighteen thousand five hundred US dollars).

Consequences: Conservation of the species in the ecosystem as the giant frog has a significant role in the food chain and it is a natural resource. Its extinction would cause an alteration in the ecosystem. Also, national and international private entities are able to see the work that is being done, and so they may integrate this in their political system to be able to fulfill their goals.

Obstacles: Lack of financial resources.

Action 5

To create spots (from 45 seconds to 1 minute) on TV, stating for instance, “Let’s preserve Lake Titicaca’s frog. Next generations have the right to get to know it”.

Person in charge: Hilver Charca Mamani.

Timeline: January – March 2011.

Measurable variable: On TV spot.

Collaborators or team members: TV UNA

Resources:

Personnel:

-Camareman: Filming scenes.

-Editor: Graphic design and spot edition.

-DENVER ZOO: putting the message together.

-TV UNA: broadcasting the message to the population.

Time required: 3 months

Costs:

-Filming trips: $90.00.

-Spot edition: $50.00.

-Logistic material: $50.00.

-Broadcast in other TV channels: $500.00.

Total: $690.00 (six hundred ninety US dollars).

Consequences: that the population becomes aware of the significance of the giant frog in Lake Titicaca’s ecosystem. Also, that private entities may see the work that is being done, and thus provide support in compliying with goals.

Obstacles: Lack of financial resources.

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Section XI

Group report

Mitigation of risks

GROUP 4: Mitigation of Risks

Members

Dante Mamani

Patricia Ponce

Darwin Luis Calla

Pilar Gaby Caracela

Alexis A. Behoom

Ricardo B. Huerta Maguina

Marialena Suana Quispe

Juan Manani Ochochoque

PROBLEM 1

Irrational extraction of the species (Lake Titicaca's frog).

GOAL

To achieve a rational and sustainable use of Titicaca's frog

Action 1

To estimate the biomass and identify habitats of frog populations in Lake Titicaca.

Person in charge: Mg. Buenaventura Del Carpio (UNA).

Timeline: January 2011 – January 2012.

Result: -To know the estimated biomass of the species (kg/ m^3).

-To establish the species habitat zones.

Collaborators: Ministry of Production, Universidad Nacional del Altiplano, IMARPE (Puno), traditional fishermen, Denver Zoo, UPCH.

Personnel and time: 1 fishing biologist (full time), 4 assistant biologists (part time – 24 hours per week each), 4 collaborating technicians in fishing or traditional fishermen (part time-24 hours per week).

Costs:

-Personnel: US$ 57600.00.

-Four (4) outboard motor boats US$ 26160.00.

-Fuels and lubricants US$ 94159.00.

-Office US$ 1500.00.

-Office materials US$ 610.00.

-Computer equipment (computer and printer) US$ 2500.00.

-Training US$ 1000.00.

-Contingencies US 9176.00.

Total: US$ 192705.00.

Consequences: Based on the obtained information, a sustainable management program of this resource may be proposed.

Obstacles: Resistance of populations to the making of research works in their habitats. Unpredictable weather conditions. Adequacy of research protocol in this respect.

Action 2

Identification of the economic, ecological, and cultural value of the Giant Frog.

Person in charge: Maria Elena Suana Quispe (UNA).

Timeline: January 2011 to January 2012.

Results: To get to know the sales price of the species (monetary value/kg), to know the role of the species in the ecosystem, as well as the medicinal and nutritional value of the species (diseases cured by it, nutritional composition of the species).

Collaborators: Ministry of Production, Universidad Nacional del Altiplano, IMARPE (Puno), traditional fishermen, Association of Physicians of Peru, Association of Nutritionists of Peru.

Personnel and time: 1 biologist ecologist (full time), 1 economist (part time), 1 nutritionist (part time), 1 medical doctor (part time), 4 multi-discipline assistants (part time – 24 hours per week each), 4 assistant technicians, traditional fishermen (part time – 24 hours per week), 10 consumer assistants with medicine and feeding purposes of the species.

Costs:

-Personnel: US$ 99000.00.

-Office: US$ 1500.00.

-Office materials: US$ 610.00.

-Computer equipment (computer and printer) US$ 2500.00.

-Training: US$ 1000.00.

Total: US 104610.00.

Consequences: Based on the information obtained, a management plan may be proposed.

Obstacles: Resistance by populations to research being performed in their habitats. Unpredictable weater conditions.

Action 3

Repopulation of the species from the implementation of rescue centers.

Person in charge: MSc. Dante Choquehuanca Panclas. Full time.

Timeline: January 2011 to December 2016.

Results: Progressive increase in the population of the species. Releases in Lake Titicaca and estuaries. Population balance of the species.

Collaborators: Universidad Nacional del Altiplano, Universidad Peruana Cayetano Heredia, traditional fishermen, Huachipa Zoo Park, Denver Zoo.

Personnel and time: 1 biologist ecologist (full time), 1 veterinary doctor (part time), 4 multi-discipline assistants (part time – 24 hours per week each).

Costs:

Personnel: US$ 99000.00.

-Office: US$ 1500.00.

-Office Materials: US$ 610.00.

-Computer Equipment (computer and printer) US$ 2500.00.

-Training: US$ 1000.00.

Total: US$ 104610.00.

Consequences: Based on the information obtained, a sustainable management of this resource may be proposed.
Obstacles: Resistance by populations to research being performed in their habitats. Unpredictable weather conditions. Adequacy of the research protocol in this respect.

PROBLEM 2:
Pollution of the species habitat.

GOAL
To reduce pollution levels of the species habitat.

Action 1
To raise the awareness of the pertinent authorities for implementation and improvement of wastewater treatment systems.
Person in charge: Lic. María Elena Suana (UNA).
Timeline: January 2011 – December 2013.
Results: Improvement in wastewater treatment systems
Collaborators: Students in the last semesters, graduated students, and teachers at the Bioscience School – Universidad Nacional del Altiplano (CCBB-UNA).
Personnel: Environmental specialist (TC).
Costs: Approximately $57,600.00.
Consequences: Adequate wastewater management. Raising awareness of authorities.
Obstacles: Lack of interest by authorities.

Action 2
To promote implementation of physical and bioremediation technologies in mining exploitation zones.
Person in charge: MSc. Dante Mamani (UNA).
Timeline: January 2011 – December 2013.

Results: Improvement in bioremediation systems.

Collaborators: Students of the last semester, graduated students, and teachers at the CCBB School-UNA.

Personnel: Environmental specialist (TC).

Costs: Approximately $57,600.00.

Consequences: Adequate management in the extraction of mining resources

Obstacles: lack of interest by mining companies.

Action 3

To promote and implement agro-ecological systems in the main basins of Lake Titicaca's estuary.

Person in charge: MSc. Dante Choquehanca Panclas.

Timeline: January 2011 – December 2013.

Results: Improvement in the agro-ecological systems.

Collaborators: Students of the last semester, graduated students, and teachers of the CCBB School – UNA.

Personnel: Environmental specialist (TC).

Costs: Approximately $57,600.00.

Consequences: Adequate use of lands for cultivation.

Obstacles: Lack of interest of communities for these new systems.

Action 4

To promote reduction and control of the emission of industrial gases and the number of automobiles in the region.

Person in charge: MSc. Dante Choquehuanca Panclas.

Timeline: January 2011 – December 2013.

Result: Improvement in reduction and control of the emission of industrial gases and the number of automobiles.

Collaborators: Students of the last semesters, graduated students, and teachers at the CCBB School- UNA.

Personnel: Environmental specialist (TC).

Costs: Approximately $57,600.00.
Consequences: Reduction and control in the emission of gases.
Obstacles: Lack of interests by industries and automobiles.

Action 5

To promote and implement biosecurity programs in the import of other species.

Persons in charge: MSc. Dante Choquehuanca and Roberto Elías.

Timeline: January 2011 – December 213.

Result: Improvement and strengthening in the biosecurity programs.

Collaborators: Students of the last semester, graduated students, and teachers of the CCBB School- UNA.

Personnel: Environmental specialists.

Cost: Approximately $57,600.00.

Consequences: Improvements in the promotion and implementation of biosecurity programs.

Obstacles: Lack of knowledge and interest by the importer.

Action 6

To strengthen the struggle against climate changes at a local, regional, national, and international level.

Persons in charge: Jessica Gálvez-Durand (Wildlife and Forest General Directorate) and the specialist from ATFFS – Puno.

Timeline: January 2011 – December 2013.

Result: Actions in making decisions against climate changes.

Collaborators: Students of the last semester, graduated students, and teachers at the CCBB School-UNA.

Personnel: Environmental specialists.

Cost: Approximately: $57,600.00.

Consequences: Strengthening the making of decisions against climate changes.

Obstacles: Lack of interest by the population.

Action 7

To promote and implement the creation of areas for recovery and conservation of the species.

Persons in charge: Jessica Gálvez-Durand (Wildlife and Forest General Directorate), and the specialist from ATFFS – Puno.

Timeline: January 2011 – December 2015.

Result: Creation and recovery of conservation areas.

Collaborators: Students of the last semester, graduated students, and teachers at the CCBB School-UNA.

Personnel: Environmental specialists.

Costs: Approximately $300000.00.

Consequences: Recovery and conservation of the species.

Obstacles: Lack of knowledge on amphibians by the personnel. Conflicts with the population in the creation of protection areas.

Action 8

To promote declaring Lake Titicaca as an intangible oil exploitation zone.

Persons in charge: Jessica Gálvez-Durand (Wildlife and Forest General Directorate) and the specialist from ATFFS – Puno.

Timeline: January 2011 – December 2015.

Result: Enacting a law protecting against oil exploitation in Lake Titicaca.

Collaborators: Competent institutions in environmental protection.

Personnel: Environmental specialists.

Costs: $57,600.

Consequences: Elimination of risks by oil pollution.

Obstacles: The policy system of the central government.

PROBLEM 3

Deterioration of the species habitat.

GOAL

To recover and preserve the species habitat under optimal conditions for their survival.

Action

To develop technical programs for an adequate management of totorales.

Persons in charge: Jessica Gálvez-Durand (Wildlife and Forest General Directorate) and the specialist from ATFFS-Puno

Timeline: January 2011 – December 2016

Result: Management and control of totorales as a habitat.

Collaborators: competent institutions in environmental protection and conservation, and shoreline populations.

Personnel: Resource assessment and environmental specialists.

Costs: $300000.00.

Consequences: Recovery and management of an optimal habitat for the frog's survival.

Obstacles: Conflicts with shoreline population.

PROBLEM 4

Limited conservationism culture

GOAL

To promote and strengthen the conservationist culture through comprehensive programs and plans of environmental education.

Action 1

To promote environmental conservation and education workshops towards society.

Persons in charge: Matt Herbert – Denver Zoo

Timeline: January 2011 – December 2013

Result: Strengthening of capabilities in environmental education.

Collaborators: Students of the last semester, graduated students, and teachers of the CCBB School- UNA. Denver Zoo.

Personnel: Environmental specialists.

Costs: Approximately $57,600.00.

Consequences: The creation of a conservationist and ecologist culture.

Obstacles: Lack of environmental awareness. Confronting with the meeting of primary needs.

Action 2

To communicate and inform on the significance of Titicaca's frog through mass media.

Persons in charge: James Garcia – Denver Zoo

Timeline: January 2011 – December 2013

Result: Population with a high level of knowledge on the significance of Titicaca's frog.

Collaborators: Specialists in amphibians, competent institutions, mass media, local authorities.

Personnel: Amphibian specialists.

Costs: $57,600.00.

Consequences: Population informed on the significance of Titicaca's frog.

Obstacles: Capability to become interested in, and assimilate information.

Action 3

To become acquainted with, and inform local populations on the effects of global warming.

Persons in charge: Matt Herbert – Denver Zoo

Timeline: January 2011 – December 2013.

Result: Population with a high level of information about global warming.

Collaborators: Global warming and environmental protection organizations.

Personnel: Global warming and environmental specialists.

Costs: $57,600.00.

Consequences: Population informed on the significance of global warming.

Obstacles: Capability to become interested in, and assimilate information.

Action 4

To promote the regulation, control, supervision, and diffusion in connection with environmental legislation.

Person in charge: MSc. Dante Choquehuanca Panclas. Full time.

Timeline: January 2011 – December 2013.

Result: Population informed of environmental policies.

Collaborators: Environmental protection organizations.

Costs: $25000.00.

Consequences: Enactment of environmental policies.

Obstacles: Local political system.

Action 5

To establish poaching prohibition programs during frog's reproduction times.

Persons in charge: Jessica Gálvez-Durand (Wildlife and Forest General Directorate) and specialist from ATFFS – Puno.

Timeline: January 2011 – December 2016.

Results: Reduction in food source extraction.

Collaborators: Amphibian researchers, fish organizations, traditional fishermen organizations.

Costs: $300000.00.

Consequences: Adequate management of programs for conservation of food sources of Lake Titicaca's frog.

Obstacles: Opposition to poaching prohibition seasons.

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Section XII

Group report

in situ research

Group 5: In Situ Research

Members

Francisco Jiménez
Roberto Elías
Herbert Soto
Carmen Torres
Jessica Gálvez-Durand

PROBLEM 1

Lack of support by the government (central, regional, and local) because there are no research policies, and there are too many bureaucratic procedures.

GOAL 1

To develop national and regional policies related to scientific research in coordination with the corresponding State entities (Ministry of the Environment, Ministry of Agriculture, Ministry of Production, and Ministry of Education) seeking continuity of these policies in time.

Action 1

Undertaking 4 workshops for development of research strategies for the region that entail participation of State entities and the scientific community.

Persons in charge: responsible person at ATFFS (MINAG) – Puno.

Timeline: 2011 – 2012

Results: To develop a strategy for development of scientific research in the region.

Collaborators: Universidad Nacional del Altiplano (UNA), Universidad Peruana Cayetano Heredia (UPCH), Denver Zoo, Grover Idme – Wildlife and Forest Technical Administration – Puno (ATFFS), Regional Government of Puno.

Personnel: Facilitators, lecturers, researchers.

Costs: $10000 ($2500 per workshop).

Consequences: To have regulating tools to enable us to develop research in the region.

Obstacles: To get all institutions involved to participate.

Action 2

Participation of citizens through local and regional coordination boards for the making of regulations involving promotion of scientific research.

Persons involved: Jessica Gálvez-Durand – DGFFS (MINAG), Hilbert Charca (ABDA)

Timeline: 2011 – 2012

Results: Creation of regulations.

Collaborators: ATFFS, UNA, PELT, UPCH.

Personnel: persons in charge from institutions involved.

Costs: $2500.

Consequences: To develop regulations promoting research.

Obstacles: Lack of interest by civil associations and authorities.

GOAL 2

To maintain a close coordination between regional and local governments, and scientific institutions, in order to develop and conduct research programs and raise financial resources.

Action

To establish agreements and alliances between the government and scientific institutions.

Persons in charge: Scientific institutions (Universities), MINAG, MINAM

Timeline: March (beginning); December (end) (PERMANENT)

Collaborators: ATFFS, SERNANP

Personnel: Responsible authorities from institutions

Costs: $2500.

Consequences: Greater collaboration and support by the State to scientific institutions.

Obstacles: Bureaucracy.

PROBLEM 2

Lack of scientific development in the region due to lack of financial resources assigned by the regional government (Lack of training, and also lack of equipment and infrastructure).

GOAL

To coordinate with the regional and local governments the development of research programs for the species conservation (biology, habitat, demographics, etc.).

Action

To participate in the preparation of the regional budget, so that a portion is assigned to biodiversity research in the Puno region.

Persons in charge: UNA and Regional Government

Timeline: July (beginning); October (end)

Collaborators: Civil Society, ATFFS, SERNANP, UNA

Personnel: Representatives of civil society, University, and authorities.

Costs: $500.

Consequences: Budget to be used for research purposes.

Obstacles: Lack of participation, ignorance about the topic.

PROBLEM 3

Lack of trust, and also lack of cooperation by local dwellers due to problems of communication, and for not knowing the goals of the species conservation program.

GOAL 1

To identify communities that might impact the habitat and biology of the species (excessive extraction of totora, Orestiasispi).

Action

To undertake surveys on the use of this species or resources the survival of which might be impacted by communities.

Persons in charge: Roberto Elías – UPCH.

Timeline: 2011 – 2014.

Collaborators: representatives of the communities, UNAP, ATFFS, other universities

Personnel: researchers.

Costs: $15000 for the work team.

Consequences: To have identified the communities involved, use of the species, risks affecting the species.

Obstacles: Language.

GOAL 2

Greater diffusion of the species conservation program with local communities using their own language (quechua and aymara).

Action 1

To prepare diffusion material in the local language in coordination with State entities and scientific institutions.

Persons in charge: Jessica Gálvez-Durand (DGFFS), Carmen Torres (I.E. NSC).

Timeline: 2011 – 2012.

Collaborators: UNA, ATFFS, UPCH, Denver Zoo.

Personnel: Graphic designer, printing office, translators.

Costs: $3350.

Consequences: Posters, triptychs.

Obstacles: Translation into local languages, distribution.

Action 2

To organize diffusion events aimed at communities in coordination with their leaders.

Person in charge: Carmen Torres (I.E.NSC).

Timeline: 2011 – 2013 (twice per year).

Collaborators: UNA, biology students of UNAP, students of I.E.NSC, community leaders.

Personnel: Anthropologists, teachers.

Costs: $4200.

Consequences: Greater acceptance and collaboration of community members to research projects to be undertaken.

Obstacles: Language, participation of communities.

GOAL 3

To raise awareness of local populations on the significance of species conservation from the ecological and economic standpoint.

Action

To organize diffusion events aimed at communities living in the vicinity of Lake Titicaca, in coordination with their leaders.

Person in charge: Carmen Torres (I.E.NSC).

Timeline: 2011 – 2013 (twice per year).

Collaborators: UNA, biology students of UNAP, students of I.E.NSC, community leaders.

Personnel: anthropologists, teachers.

Costs: $4200.

Consequences: greater acceptance and collaboration by community members to research projects to be undetaken.

Obstacles: Language, participation of communities.

PROBLEM 4

Lack of information on the species (lack of diffusion and publications of research works).

GOAL 1

To promote research works and subsequent publications with renowned scientific associations.

Action 1

To implement scholarship programs for research work developments.

Person in charge: Dante Choquehuanca – Dean, Bioscience School – UNA.

Timeline: 2011 – 2016 (YEARLY).

Collaborators: Regional Government.

Personnel: University Teachers.

Costs: $10000 ($2000 PER YEAR).

Consequences: More information as a result of the research that was conducted.

Obstacles: Lack of financial resources, and lack of interest by researchers.

Action 2

To include undergraduate courses in the curriculum related to research methodology.

Person in charge: Dante Choquehuanca – Dean at the Bioscience School – UNA.

Timeline: 2011 – 2012.

Collaborators: University Teachers.

Personnel: Teachers.

Costs: $1000 per course (OPTIONAL).

Consequences: Students trained in the application of different scientific research methodologies, which will be reflected on the development of better proposals.

Obstacles: Lack of willingness to implement the course.

GOAL 2

Better training of local researchers on research methodologies and publications.

Action

To implement graduate courses to promote research of the species.

Person in charge: Dante Choquehuanca – Dean at the Bioscience School – UNA.

Timeline: 2011 – 2012.

Collaborators: University teachers.

Personnel: Teachers.

Costs: $2000 PER SEMESTER COURSE

Consequences: Students trained in the application of different scientific research methodologies, which will be reflected on the development of better proposals.

Obstacles: Lack of willingness to implement the course.

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Section XIII

Recommendations

Group 1: Engage, and raise awareness of the population

-Actions and goals of the strategic alliance group, must be incorporated within the actions of the awareness group education program.

-That there are no delays in the preparation of the document.

-To prevent work overlap, and to unify criteria, like in the education and diffusion component.

-The research group in situ stated that it would implement a course on "Research Projects", which actually exists with the name of research methodologies.

-The mitigation of risk group presented only some of the risks or threats stated in the plenary meeting; therefore, the strategy should consider others that are very important for the Titicaca's frog, such as: tourism, introduced species, loss of habitat, etc.

-Where will the money come from? There is a basis.

-The document to be published, created or endorsed in Bolivia, to determine if the same is feasible for this environment; if so, to create a counterpart team for the strategy, and that it becomes a binational strategy in favor of the conservation of the frog and its habitat.

GROUP 2: Captivity breeding

-To establish a strategic alliance between institutions that keep the species in captivity, and institutions performing captures.

-To create a temporary custody area in the city of Puno, with adequate facilities and trained personnel.

-To use the lab of Universidad Nacional del Altiplano, in Puno, Peru, for diagnosis of the fungus in individual frogs captured in Lake Titicaca, through the PCR method.

GROUP 3: Strategic Alliances

-To maintain a liaison among institutions committed to the plan.

-To establish a team's mission and vision.

-To make permanent follow-up of the procedures related to documents oriented to seek agreements, financing, technical support, and others, with the pertinent entities.

-To remain strong before every challenge that arises during the execution of the plan.

-To undertake a monthly assessment of the progress achieved.

GROUP 4: Risk Mitigation

-To arrange a team of specialists to conduct participative research projects.

-To secure budgets and logistic material to implement surveys.

-To organize breeding modules at representative places of Lake Titicaca.

-To make strategic alliances among institutions connected with conservation of this resource and environmental pollution problems (public and private).

-To train farmers for promotion of agro-ecological systems.

-To promote regulation and implementation of municipal regulations for control of contaminating automobiles.

-To implement strategies on formal and informal environmental education in connection with global warming.

-To establish zoning of areas for recovery of the species.

-To coordinate with the Executive and Legislative Powers to prevent contamination produced by hydrocarbons in Lake Titicaca.

-Training of users of totorales for better management of the same.

-To coordinate with the National Reserve for implementation of poaching prohibition seasons.

GROUP 5: In Situ Research

-To perform the study of the Andean cosmovision of the Telmatobius culeus species.

-To contact the Regional Government.

-To improve interinstitutional coordination between the local and regional government, PECT, SERMANP, MINAGE, Universities, etc.

-Greater diffusion of research works about the species undertaken by Universidad Peruana Cayetano Heredia, and Universidad Nacional del Altiplano, and other institutions or persons.