Establishing a regional framework for amphibian monitoring and conservation in Mesoamerica

Final report:
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1. Introduction

Conservation International, the Arizona State University, the Regional Institute for Biodiversity of the Central American Commission for Environment and Development (IRBIO/CCAD), the Critical Ecosystem Partnership Fund (CEPF), and the Zamorano Center for Biodiversity (CZB, acronym in Spanish) conducted the workshop: "Establishing a regional framework for amphibian monitoring and conservation in Mesoamerica". This workshop is linked to the first activities that have been planned for the implementation of the Regional Strategic Biodiversity Monitoring and Evaluation Program (PROMEBIO, acronym in Spanish) funded by the Inter-American Development Bank (IADB).

The workshop was carried out September 3 to 5, 2008 at the campus of the Pan-American School of Agriculture – El Zamorano, with the participation of 67 people (Figure 1).

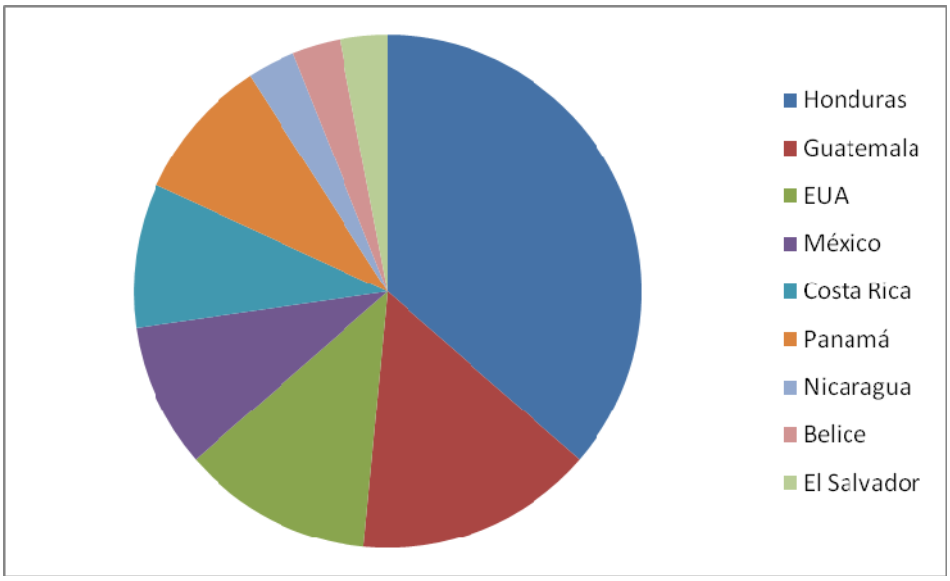

Figure 1. Number of participants per country at the workshop conducted to establish a regional framework for amphibian monitoring and conservation in Mesoamerica, Zamorano, Honduras, September de 2008.

Participants largely included professionals and experts in biology and amphibian conservation, must of which came from universities, as well as conservation agencies and research institutes (Figure 2).

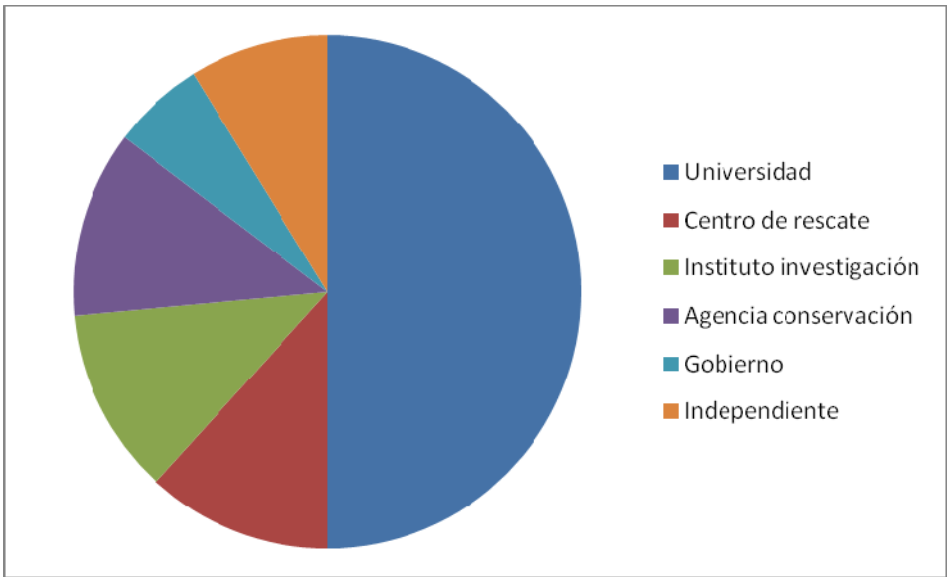

Figure 2. Institutions of origin of participants at the workshop conducted to establish a regional framework for amphibian monitoring and conservation in Mesoamerica, Zamorano, Honduras, September de 2008.

Participants were asked to present amphibian status in their countries. Common subjects they addressed included:

- Status of national strategy for amphibian conservation
- Overview of current projects on amphibian conservation and monitoring
- Institutional resources in the country for amphibian related aspects

Other lectures and presentations involved general topics, such as:

- The need to review sites where data collection was made in the past to confirm the presence or absence of species
- IUCN's specialist group on reproduction in captivity
- The Amphibian Ark initiative

Four independent groups were integrated to discuss the same following topics:

a. Amphibian conservation in Protected Areas
b. Amphibian conservation outside Protected Areas
c. Study of decline factors
d. Breeding amphibians in captivity
e. Monitoring systems
f. Climate change and survival

Each work group analyzed the proposed topics and presented a summary of their discussion results at a plenary. During the closing session, two additional topics arose: information systems, and databases.

Workshop members agreed not only on making use of the various regional possibilities to carry out periodic meetings, but to open an electronic forum where discussion can continue.

2. Agenda

The following was the agenda for the workshop:

Day	Hour	Activity
September 3	4 pm. 6 pm	Arrival of participants Tour around Zamorano Dinner
September 4	8:30 am	Opening Carlos Garcia, Director of Biodiversity, Honduras, Pro-temp President to the Technical Biodiversity Committee/CCAD Danilo Alvarado Head of Natural Heritage, CCAD Franklin Castañeda, Amphibian Specialist Group, UICN Jaime Garcia-Moreno, Director Biodiversity Analysis and Species Conservation, Centre for Biodiversity Conservation Mexico and Central America, Conservation International José M. Mora, Director a.i. Socioeconomic and Environment Development Department; Scientific Director, Zamorano Center for Biodiversity. Jorge Ivan Restrepo, Director Regional Biodiversity Institute
	9:00 am	Workshop Objectives Jaime Garcia Moreno and José Manuel Mora
	9:20 am	Presentations on national strategy status – One speaker per country supported by participants – 15 minutes per country Panama Costa Rica Nicaragua
	10:05 am	Coffee break
	10:20 am	Country presentations continue El Salvador Guatemala Belize

		Mexico
	12:20 pm	Lunch
	2:00 pm	Topic presentations Joe Mendelson Jonathan Kolby
	2:20 pm	Integration of work groups – group work begins Groups: Amphibians in protected areas Amphibian conservation outside protected areas Breeding in captivity
	3:30 pm	Coffee break
	3:45 pm	Group work continues
	5:00 pm	Plenary
	6:40 pm	Topic presentations Danny Mazariegos
	7:00 p.m.	Dinner
September 5	8:00 am	Topic presentations Honduras Michael Dix Yolanda Matamoros
	8:40 am	Group work Monitoring systems Study of decline factors Climate change and survival
	10:00 am	Coffee break
	10:15 am	Group work continues
	11:15 am	Plenary
	12:20 pm	Lunch
	2:00 pm	Topic presentations Joe Townsend Edgardo Grifith

		Víctor Hugo Reynoso
	2:20 pm	Strategy development – Plenary
	3:30 pm	Coffee break
	4:30 pm	Integration of the drafting commission
	5:00 pm	Adjournment
	5:30 pm	Transportation to barbecue Meeting place at the Kellogg Center parking lot
September 6	8:00 am	Optional tour around Zamorano for people traveling in the afternoon

3. Results and conclusions from the work groups on the topics discussed

a. Study of decline factors

The work groups concluded that the main decline causes are loss of habitat, pathogens, environmental pollution, introduced species and illegal trafficking. Considering these factors, it is necessary to take joint actions at the regional level to optimize efforts.

Some of these actions are:

I. Promoting large scale surveys (for example across an entire watershed) in order to determine the status of species and the degree of infection of organisms at each site with different environmental characteristics. These surveys should collect data on water quality (pesticides, BOD, etc.), atmospheric data (temperature, humidity, precipitation, etc.).

II. Encouraging execution of projects related to diseases, different to chytridium-fungi associated, that cause or contribute to decline.

III. Establishing quarantine protocols for amphibian exports, making pathogen analyses before departure from the country.

IV. Reviewing CITES lists, analyzing their deficiencies or weaknesses on amphibian species in the region.

b. Amphibian conservation in protected areas

Main existing threats and weaknesses were identified as a first step on this effort:

- Loss of habitat
- Inappropriate design of management plans or lack of them
- Short supply of qualified personnel
- Information gaps in inventories

Several existing needs were identified based on these issues, highlighting the need to generate basic information, which can be overcome by a National Species Inventory, where existing information should be gathered by reviewing databases in collections at museums, as well as cataloguing information in collections. In order to do this, it is important to choose one coordinator per country, and have qualified personnel who would receive training.

Regarding Protected Areas, the following general matters were acknowledged:

I. It is necessary to learn about conditions in Protected Areas, and prepare inventories to determine the species that dwell in them, to design appropriate monitoring plans in each zone.

II. According to the needs, funds should be sought for the creation of small private protected areas, managed by Universities, NGOs or other local organizations.

III. Effectiveness of each zone should be evaluated in terms of protection of amphibians, determining the minimum size of each area to meet protection purposes.

IV. It is necessary to implement inferential models of distribution for future evaluation of conditions.

V. Communities should get involved in habitat protection by using incentives or establishing agreements between the community and the responsible organizations or the governments.

VI. In case of protected areas shared by various countries, joint management should be coordinated.

VII. Work should be accomplished on communicating the value of amphibians to the public in general, particularly to those inhabitants in nearby communities.

VIII. Proposal to adopt an amphibian or flag species nationally and regionally. This can include choosing a national amphibian by country.

IX. Promote training for “para-biologists” to cooperate in monitoring and management of organisms as to facilitate composition studies of amphibian fauna in each zone.

X. It is necessary to socialize and implement bio-safety protocols as a standard in the entire Protected Area.

XI. Economic assessment studies on amphibian environmental services, as well as economic benefits (bio-prospection) and pest control should be developed.

XII. Implementing water quality monitoring using amphibians, and add chemical analysis studies of the water bodies in each site.

c. Amphibian conservation outside Protected Areas

The following was determined in terms of amphibian conservation outside protected areas:

I. Conservation of amphibians requires hard work on laws and policies; for example, regarding control of introduced species, and including environmental impact evaluations and effect of development on amphibian populations.

II. Universities should develop extension programs including environmental education and training, both for locals and foreigners.

III. It is important to propose connectivity strategies in urban zones for species isolated in these areas, analyzing feasibility of improving green areas to generate viable habitats for amphibians.

IV. Actions in rural zones should be developed to support inhabitants in the surroundings of the PAs on aspects such as organic agriculture or friendly crops.

d. Breeding amphibians in captivity

This is apparently a mandatory practice to preserve several species of amphibians in the region. However, it is necessary to be cautious and take several aspects and measures into consideration to execute this, some of which are:

I. Each country breeding amphibians in captivity should have appropriate laws to rule the operation of breeding venues and to oversee trade of species (when applicable).

II. A management plan contemplating bio-safety, contingency plans, and a closing plan should be developed.

III. A regional work group should be established to undertake fundraising, and develop general protocol guidelines.

IV. Each country should create its own work groups, depending on its needs, based on the regional plan, and should have a representative who would keep information updated.

V. Meetings or other kind of reunions should be carried out, in order to exchange experience and information.

VI. It is necessary to choose species based on AARK methodologies to rank priority, and to initiate the programs with those species with the best known biological characteristics.

VII. When, how and where to capture and release organisms, or otherwise commercialize them, if applicable, will be determined according to ecological studies of each species.

VIII. Maximum advantage should be obtained from organisms in captivity; for example, to develop studies on ecology and behavior. These studies would try to somehow compensate the lack of studies under wild conditions.

IX. It is necessary to generate genetic, pharmacological or other type of information related to resistance and vulnerability of amphibians to disease.

e. Monitoring systems

Monitoring species and populations of amphibians is critical to take actions for their survival. However, in order to carry out monitoring programs it is necessary to consider several aspects, such as:

I. Having a list of priority sites to make inventories and impulse development of quantitative inventories (abundance, presence/absence).

II. Involving multiple stakeholders that go from universities to local population.

III. Provide the necessary technical and taxonomic training for diverse stakeholders in order to carry out studies and conservation actions with full efficiency.

IV. Establishing purpose of monitoring (for example, long term versus short term) depending on necessary information to be collected (changes in species, population trends, environmental parameters, prevalence of pathogens, etc.)

V. Once monitoring sites are identified, determine those in which long term monitoring should be conducted, and where further monitoring should be accomplished on habitat quality (climate change, quality of water, habitat degradation and deforestation), presence of pathogens (fungi, iridiovirus, etc.).

VI. Link monitoring to the Protected Area Ecological Integrity Monitoring Tool (PROARCA-CAPAS, CCAD), and standardize all protocols at the regional level.

VII. Set up a virtual platform to facilitate exchange and flow of information between public and private entities at the national and regional levels, both on monitoring results and on other experiences.

VIII. Identify people in charge of keeping information updated, and potential sites for sample processing at the regional level (genetic samples, pathogens etc.).

e. Climate change and survival

This should be an area of emphasis for research and conservation actions. Recommendations to achieve this are:

I. To have environmental data and use standardized protocols at the regional level.

II. Develop geographical information systems, such as integrated threat modeling and monitoring.

III. Review current models to analyze advantages, strengths and weaknesses, and make recommendations for their implementation.

4. Final recommendations

Final recommendations were drawn up at the work groups in addition to the topics discussed. These recommendations can play a main role for conservation of amphibians in the region:

1. Integrating or reactivating concrete work groups (i.e. RANA), which should become an information network, facilitating cooperation among members in preparing articles to have a stronger impact.

2. Hold periodic meetings to exchange experiences.

3. Develop courses aimed to technical development and capacity building in the region.

4. Raise regional funds to cover expenses for different events and trips for participants.

5. Create regional work commissions to drive national actions, with one representative from each country.

6. Establish electronic forums that will benefit exchange of information and quick and timely communications. Use and socialize existing data bases and means of information exchange.

7. Establish a sole information platform synthesizing, putting together, and consolidating existing information and information to be generated.

8. Establishing priority protocols for monitoring and studying pathogens and environmental data.

9. Include work at the forest canopy, and altitude gradients, within monitoring, and make an appropriate design in each project to make it possible to analyze data in a unified and efficient way.

10. Translate protocols and manuals from English into Spanish and vice versa, making them more accessible.

11. Generate contact lists of experts both for each country and for the region, and from other geographical regions.

12. Make joint alliances with agencies and bodies such as WWF, CITES and their authorities, as well as with other organizations, to unite efforts.

13. Foster the creation of synergies among professional groups from other areas (eco-toxicologists, chemists, etc.)

14. Release information generated by research to the public in general, especially to inhabitants of the areas next to places where research is made.

15. Create alliances among researchers to reduce genetic or pathogen sample processing costs.

5. Amphibian conservation strategy in Mesoamerica

Several agreements were reached regarding components discussed:

1. **Monitoring**: a subgroup of participants (Roberto Ibañez, Antonio Muñoz, Edgardo Griffith and Victor Reynoso) will produce a monitoring protocol that will include populations, environment, and specific follow up for chytridium fungi. This should be applicable in all the countries in the region. Even when a term of three months was established as the final term for the delivery of this product, it has not been completed yet.

2. **Amphibians database for the region.** Federico Bolaños agreed to produce a list of available information. This list will be in "Excel" format and will be accessible in three months (similar to the former case).

3. **Systematization of databases from scientific collection**: using existing databases and appointing country coordinators. Even when this item is still in process, the idea is to produce a list of experts with their name and area of work or specialization.

4. **Review of CITES lists**: it was agreed to request recommendations from the WWF TRAFFIC program, and make proposals to CITES in future meetings.

5. **Monitoring water quality**: there was consensus about the need for showing damage that chemical substances cause to water. The group agreed on the need to choose priority sites to monitor water quality in the region related to amphibians. Carlos Vasquez and Antonio Muñoz committed to produce a list of characteristics these sites should meet.

6. **Education**: there is a need to define existing information gaps, and obtain funds to generate the necessary material for education and release of information related to amphibians. This can be started using Internet sites, and translating their content into Spanish.

One of the most important points was the creation of a team to draf a regional action plan that will be based on the input from the entire group. Once written, the proposal will be sent to all the workshop participants in order to receive suggestions. This proposal will be further shared with the Technical Committee on Biodiversity from CCAD. This Group is integrated by Joseph Mendelson, Federico Bolaños, Antonio Muñoz, Jaime Garcia-Moreno, José Manuel Mora and Edgardo Griffith. It is critical and necessary to receive feedback from the varied task sub-groups mentioned above.

Annex
List of participants

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