

The Conservation of the Axolotl (*Ambystoma mexicanum*) in Xochimilco, Mexico City

A Species / Habitat Action Plan



Produced by the Darwin Initiative International Seminar / Workshop
Held at UAM-X / CIBAC

6th - 9th December 2004

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Foreword

Vijay Rangarajan, Chargé d'Affairs, British Embassy, Mexico



I'm delighted that the British Embassy in Mexico has been able to support and encourage the Axolotl Species/Habitat Action Plan. It's an important contribution to the long-term conservation of this remarkable species and its habitat, and should encourage consideration of wider issues concerning natural resource management and environmental conservation. Perhaps most importantly it represents the outcome of an open and co-operative engagement involving Mexican stakeholders and international partners, and, as such, is an excellent example of how the Darwin Initiative can stimulate a collaborative process that has real-world outcomes. I hope this publication will help further stimulate the involvement of other government, NGO, and local partners, and ensure that the axolotl, together with the wonderful heritage of Xochimilco, will be preserved for the benefit of future generations.

❖ *Vijay Rangarajan, Chargé d'Affairs, British Embassy, Mexico* ❖



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Summary

The purpose of this document is to provide a framework Species/Habitat Action Plan (S/HAP) for the conservation of the Axolotl (*Ambystoma mexicanum*) in Xochimilco, Mexico D.F. The process leading to its publication was part of a 3-year UK Government Darwin Initiative project (Ref. 162/11/018) entitled “Aztecs and Axolotls: Integrating Tourism and Conservation at Xochimilco, Mexico City”, which began in April 2002, and whose principal partners were CIBAC (Centro de Investigaciones Biológicas y Acuícolas de Cuernavaca, Universidad Autónoma Metropolitana, Unidad Xochimilco, México) and DICE (The Durrell Institute of Conservation and Ecology, University of Kent, Canterbury, UK). From 6-9 December 2004, the project team ran an Axolotl Species/Habitat Action Plan formulation workshop at UAM-X/CIBAC, in which representatives of most of the key governmental, NGO and local stakeholder organizations participated alongside representatives of UK-based partners. Two days of scene-setting presentations were followed by two days of collective and group-based workshop activities in which key elements affecting the conservation of the species were first identified and categorised into broad subject areas. The key subject areas that emerged were: the biology of the species; ecological interactions; environmental factors; use and exploitation; legislation; social factors; political factors; and, education, which collectively formed the framework of the Plan. Subsequently the workshop identified and assessed a series of specific goals under each heading, and designated appropriate actions for each. Each action was then accorded a level of priority and a timeframe, lead agencies were allocated, and consideration given to the issues surrounding funding and partnerships. This document summarises key background information, explains the design and conduct of the workshop, and presents the plan that emerged from this process. The draft version was circulated to all participants and other interested parties for feedback, and all contributions integrated into this final document. It should provide a useful starting point and tool for those involved in the management and conservation of the Xochimilco wetland system and its wildlife, most particularly in relation to activities focused around the axolotl. A recent decision by the Mexican Senate should valuably encourage this process (Appendix 5). ❖

Acknowledgements

The authors would like to thank all those who participated in the workshop - those who gave so generously of their time, expertise, enthusiasm and determination, and those who provided the financial and other means of support that made the process possible. Special thanks should go to Gerardo Garcia of the Durrell Wildlife Conservation Trust - who made such a splendid job of facilitating the workshop, the members of the Project Team, to UAM-X for hosting the event, and the British Government’s Darwin Initiative programme - whose financial support made the creative process and publication of this document possible at this time. ❖



Dedication - Dr. Virginia Graue

This plan is dedicated to the memory of the late Dr Virginia Graue of UAM-X, the former Director of CIBAC, who first initiated the project and whose passion for the axolotl, together with her determination and good humour, continues to inspire all those who had the privilege of knowing her. ❖



Dr. Virginia Graue

'Since biodiversity is the living foundation for sustainable development, efforts to conserve it that integrate improved human welfare and progressive development should be a vital component of our strategy to achieve a better future for humanity (CBD 2005).'



Biodiversity and Why It Matters

The term “biodiversity” (Wilson 1992) encompasses the whole wealth of life on earth, including a host of different ecosystems, habitats and communities, the differences in the assemblages of species within and across these communities, the variety, number and taxonomic uniqueness of species, and the genetic variability within and between populations of the same species. It is important because it provides so many of the essentials of our lives – oxygen, food, water, stable soils, clothing and medicines, as well as a connection with, and experiences of, the living world that may even help our psychological well-being. Biodiversity is also a key test of the sustainability of our societies and their forms of production and consumption, indeed the long-term viability of our species itself. If biodiversity is rapidly disappearing because of our actions, we are not making sustainable decisions. Both urban and rural dwellers should share the right to a countryside rich in wildlife alongside the right to access to other services such as health and education. Since biodiversity is the living foundation for sustainable development, efforts to conserve it that integrate improved human welfare and progressive development should be a vital component of our strategy to achieve a better future for humanity (CBD 2005).

The International Framework

The Convention on Biological Diversity (CBD), signed by government leaders from 150 countries (including Mexico) at the 1992 Rio Earth Summit, recognizes the importance of biodiversity and the urgent need for efforts to stop its ongoing loss. The CBD is dedicated to promoting sustainable development alongside the sustainable use of biological resources. It seeks to: encourage measures that will anticipate, prevent and attack the causes of significant reduction or loss of biological diversity at source; increase levels of relevant information and knowledge; develop appropriate scientific, technical and institutional capacities; help the in-situ conservation of ecosystems and natural habitats; and the maintenance and recovery of viable populations of species in their natural surroundings; and involve indigenous and local communities in sharing equitably in the benefits arising from the use of traditional knowledge, innovations and practices relevant to the conservation of biological diversity. This Axolotl Species/Habitat Action Plan framework is an example of how international and regional cooperation can - albeit in a small way - make a positive contribution to this process.

Biodiversity of Mexico

Mexico, with its geographical position and wide range of habitats and climates is one of the world’s most biologically diverse countries. In fact, it is considered to be one of the 12 ‘mega diverse’ countries of the World (Mittermeier & Mittermeier 1992). So far some 65,000 species have been recorded nationally and as many as 200,000 are thought to exist. As Table 1 illustrates Mexico is home to a high proportion of the world’s recorded species across many taxa, and hosts a considerable proportion of nationally endemic species. Whilst

Table 1. Mexican species: the number of recorded species and relative importance of Mexican biodiversity across selected plant and animal taxa.

Group	Total No. of Species	% of the World's Diversity	No. of Endemic Species	% of Endemic Species
Cactaceae	669	70%	518	77%
Agaveaceae	217	75%	146	67%
Mollusca (marine)	4,100	8%	920	22%
Arachnida	2,506	7%	1,759	70%
Decapoda	1,410	14%	98	7%
Hymenoptera	2,625	8%	194	7%
Lepidoptera	2,610	8%	200	8%
Coleoptera	7,988	5%	2,087	26%
Amphibia	289	7%	174	60%
Reptilia	705	11%	>368	52%
Aves	1,076	11%	104	10%
Mammalia (terrestrial)	522	12%	142	29%

Source: Cacti species (Guzmán et al. 2003), bird species (Howell & Webb 1995, González-García & Gómez de Silva, 2003); terrestrial mammals (Ceballos et al. 2002); reptiles and amphibians (Flores-Villela 1993).

Mexican representatives dominate in the plant families Cactaceae and Agaveaceae, only Australia has more known endemic reptile species (605), Brazil alone more endemic amphibians (293), and Australia (210) and Indonesia (165) greater numbers of recorded endemic mammals. The diversity of vascular plants is similarly large. Estimated at between 22,800 and 26,000 species it is currently the fourth highest in the world, and is characterized by a very high degree of endemism, approximately 52% of the species being restricted to Mexico alone (Mittermeier & Mittermeier 1992; Rzedowski 1993).

Xochimilco and the Axolotl (*Ambystoma mexicanum*)

The Mexican axolotl (*Ambystoma mexicanum*) is possibly one of Latin America's most threatened amphibians. The vast wetland upon which Mexico City was founded, and which once provided a rich and productive habitat for the axolotl and other endemic fauna, is now reduced to a handful of small, isolated patches surrounded by development. Of these, the area called 'Lake Xochimilco' is the largest, covering just over two square kilometres (see Figure 1). It too is no longer a lake, having been fundamentally altered by the development of the sophisticated 'chinampas' agricultural system, which started in pre-Aztec times. This consists of raised fields of mud and vegetation coralled by rectangular plantings of the water-loving willow, *Salix bonplandiana*, which has reduced most of the lake to a series of canals of varying widths (~182 km. total length). Habitat loss, introduced predators, pollution, and continuing illegal collection for food, medicines and possibly the pet trade, have all taken their toll on the axolotl. Consequently, the threats facing this species are complex and not easily reversible. However, its prominent position in the ancient lacustrine economy of the region, coupled with its importance in Aztec mythology (the nahuatl word "axolotl" meaning "water dog"

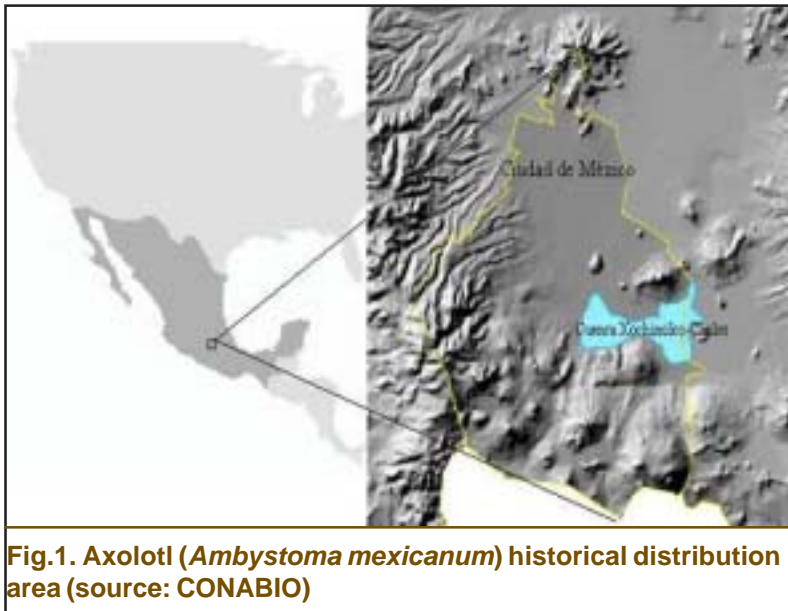


Fig.1. Axolotl (*Ambystoma mexicanum*) historical distribution area (source: CONABIO)

describes an animal said to have been born when the Aztec god, Xolotl, fearing his imminent sacrifice, threw himself into the water and was transformed into the creature we see today), means that the axolotl is well known, if poorly understood, among local people. It therefore provides a good choice as a flagship species for conservation. Moreover, some 2000 local boatmen (remeros) earn significant amounts of money by punting visitors along the lake's canal system in gaily decorated pleasure boats (trajineras), whilst farmers (chinamperos) still cultivate the adjacent land in the way their ancestors have done for centuries,

which means the site continues to be highly valued by local people. Fishing is also important to the local economy (~80 fishermen), and although non-native Asian carp and African *Tilapia* have replaced the axolotl as the main catch, researchers have yet to improve upon the highly skilled traditional netting method used by the fishermen for finding axolotls. As well as providing a place to which the residents of one of the world's largest and most populous cities can escape for relaxation, the remnant wetland of Xochimilco is also a haven for a considerable amount of resident and migratory wildlife. For instance, some 170 species of tree and flowering plant amongst 563 species of flora (Zavaleta-Beckler & Ramos-Espinosa 1999) and more than 160 species of bird (Hernández-Rivera & Meléndez-Herrada 1985) have been recorded at the site.

Despite its precarious status in the wild, throughout the world the axolotl is a familiar sight in laboratories and aquaria. Animals were originally collected in 1863 for the Natural History Museum in Paris, and many of today's captive animals probably stem from these founders (Smith 1989). As well as being a popular pet it is extensively used in medical research because it possesses remarkable biological traits that distinguish it from other vertebrates. Like many other amphibians, the axolotl lays its eggs in freshwater and these hatch as larvae that obtain oxygen from the water using gills, develop four legs, and feed on small plants and animals. However, unlike typical amphibians the axolotl does not change from an aquatic to an air breathing life (meta-

morphosis). It instead undergoes a process called "paedogenesis" becoming sexually mature in the aquatic larval form, and living up to 10-12 years. Females lay up to 1000 eggs every 3-6 months, and adults reach 30 cm in length. They are usually black in colour (white - so called 'albino' - specimens and other colour phases have also been produced in the laboratory) and feed mainly on invertebrate prey. Perhaps the most impressive aspect of its biology is the axolotl's power of regeneration. Not only can it reproduce a new limb or tail when these have been lost by accident or through attack by a predator, the axolotl can also regenerate brain and heart cells, characteristics that have made it a focus of a considerable amount of research with a long-term application for human health.

Restocking and Legislation

As a result of the ease of availability of captive populations there is considerable interest in restocking Lake Xochimilco with axolotls. This is seen as a way of preserving the species within what remains of the little-studied habitat that provided the unique conditions in which its remarkable biology first evolved, and where the key to understanding this biology may lie. There are however, several problems associated with such releases. At the very least, the in-situ threats to the species need to be neutralized and potential disease and genetic problems addressed before captive animals are put back into the wild (Griffiths et al. 2004). The introduction of a disease or abnormal genes from a captive bred population could wipe out the remaining wild stock. So any such introduction has to be conducted with extreme caution. Existing colonies also need to be analysed and compared to wild-caught specimens (and *Ambystoma tigrinum*) in order to determine their genetic status. Moreover, the population that does still exist, may well be so fragmented that each sub-population has become genetically distinct. The provision of disease-free, pure-bred axolotls and monitoring of the health status of captive and wild populations are key components of any programme for the recovery and conservation of the wild population. Furthermore, even if a restocking programme were to succeed the question of whether a sustainable harvest could be made to meet local demands for the species is also likely to arise.

Even though there is a supply of captive bred axolotls, wild animals are still being captured and sold illegally in local markets (McKay 2003), and this trade is very difficult to police. A proposal to upgrade *Ambystoma mexicanum* from CITES Appendix II (controlled international trade) to Appendix I (species threatened with extinction and international trade permitted only in exceptional circumstances) is currently under review by the Mexican authorities and the Animals Committee of CITES. Also, Mexican authorities are considering placing axolotl (under the relevant Mexican legislation NOM-059-SEMARNAT-2001) in a risk category that best fits the current risk status of the species. This would mean its transfer from "*Species under special protection*" (Pr) to "*Endangered*" (P), thereby conferring upon the species maximum protection under Mexican legislation. This document is intended to help the relevant organizations address all the above issues.

Taxonomy of the Axolotl

Phylum: Chordata - animals with a hollow nerve chord running down its body

Subphylum: Vertebrata - animals with a bony 'spine' enclosing its nerve chord

Class: Amphibia - four legged vertebrates (although some have become legless), adults usually air-breathing and mainly terrestrial, breeding in water, shell-less eggs, young are aquatic with gills.

Order: Caudata (Urodela) - tailed amphibians – the salamanders

Family: Ambystomatidae - Mole salamanders

Genus: *Ambystoma* - genus containing 31 species (5 of which exhibit varying degrees of neotony)

Species: *Ambystoma mexicanum* - the endemic species found at Xochimilco and Lake Chalco.

The Darwin Initiative Project 'Aztecs and Axolotls: Integrating Tourism and Conservation at Xochimilco, Mexico City'

Building on its existing profile among the people of Xochimilco, over the past three years a partnership of British and Mexican organizations has been developing a conservation programme for the axolotl (Griffiths et al. 2004). The project was the brainchild of the late Dr Virginia Graue of the Universidad Autónoma Metropolitana at Xochimilco (UAM-X), who contacted the Durrell Institute of Conservation and Ecology (DICE) in 1999 for assistance with development of the project. As it was clear at that time that addressing the many threats that the axolotl faced would be impossible without the co-operation of local stakeholders, the project initially focused on embracing local people within the conservation planning process by developing the axolotl as a flagship species for nature tourism and conservation education within the region. Using UAM-X's existing field station (CIBAC) on the shores of the lake as a base, and with funding from The Declining Amphibian Population Task Force (DAPTF) and the British Government's Darwin Initiative programme (DI), the project partnership has run training workshops on amphibian biology and conservation for local students and conservation organizations, nature guiding for local boatmen, and souvenir production for unemployed artisans. In addition, the project has been engaged with ongoing biological research on population status and the assessment and impact of threats (McKay 2003), workshop facilitation, and public education and awareness-raising.

Darwin Initiative Project: Team Members and Partner Organizations

The principal partner organisations have been:

- ❖ Centro de Investigaciones Biológicas y Acuicolas de Cuemanco (CIBAC), Universidad Autónoma Metropolitana, Unidad Xochimilco (UAM-X).
- ❖ Durrell Institute of Conservation and Ecology (DICE), Dept. of Anthropology, University of Kent, UK.
- ❖ The Declining Amphibian Population Task Force (DAPTF), Open University, UK.
- ❖ Department of Design and Technology (UAM-X).
- ❖ The British Herpetological Society (BHS).
- ❖ North of England Zoological Society, Chester Zoo, UK.
- ❖ Indiana University Axolotl Colony, USA.

Other partners are:

- ❖ Comisión Nacional para el Conocimiento y Uso de la Biodiversidad (CONABIO - the National Commission for the Knowledge and Use of Biodiversity), Mexico.
- ❖ Parque Ecológico, Xochimilco (PEX).
- ❖ Instituto de Biología, Universidad Nacional Autónoma de México (IB/IUNAM).
- ❖ Dirección General de Zoológicos de la Ciudad de México (DGZCM), (Chapultepec Zoo, San Juan de Aragón Zoo and Los Coyotes Zoo).
- ❖ Toronto Zoo, Canada.

The Seminar / Workshop Process

The organisation of the Axolotl S/HAP seminar/workshop began early in 2004, with the agreement of UAM-X and support from its rector, Maestro Norberto Manjarrez Alvarez. After the format had been decided upon and dates set, individuals and organizations were approached through the existing project network and other contacts. They were sent an announcement of the workshop and details of its objectives and design. Organizations were asked to indicate whether they would be sending a representative and to recommend other possible contributors, with participants being solicited from government and non-government organizations, universities, research institutions, and the media, as well as remeros and other local stakeholders. It was decided that the number of participants in the workshop section would be kept to approximately fifty in order to allow the workshop process to proceed smoothly within the available resources. However, in the event no cap on numbers was necessary.

Over the first two days of the event (see schedule, Appendix 2) the partners and other key participants had the opportunity to present findings that had emerged from the project and related work. These presentations

covered legal protection, local planning, nature tourism, engaging the local community, ecology and impact of threats, captive breeding and reintroduction, ecoregional design, flagship species and public education. They served to summarize and consolidate information gathered during the course of the project and provide a framework for the two subsequent days of participatory workshop. Bilingually facilitated by Gerardo Garcia of the Durrell Wildlife Conservation Trust, the workshop collectively identified the key components of the Axolotl Species/Habitat Action Plan and set goal-oriented tasks with a view to producing the framework for this plan. After a plenary brainstorming the issues facing the axolotl and its habitat, five workshop groups were formed, with each including two or three bilingual Spanish/English speakers, being broadly representative of the mix of participants, and appointing a Chairperson, Recorder and Timekeeper. These groups, whose composition was reshuffled on day 2 of the workshop, were then given the task of placing the main issues into categories, setting goals and objectives for addressing these issues, identifying appropriate actions for these objectives, assigning lead agencies to these actions and finally assigning timeframes and organizations to the various actions – the findings of each of these stages being shared and discussed in a workshop plenary session. This format allowed input from all participants. The following flow chart represents the workshop process (Figure 2).

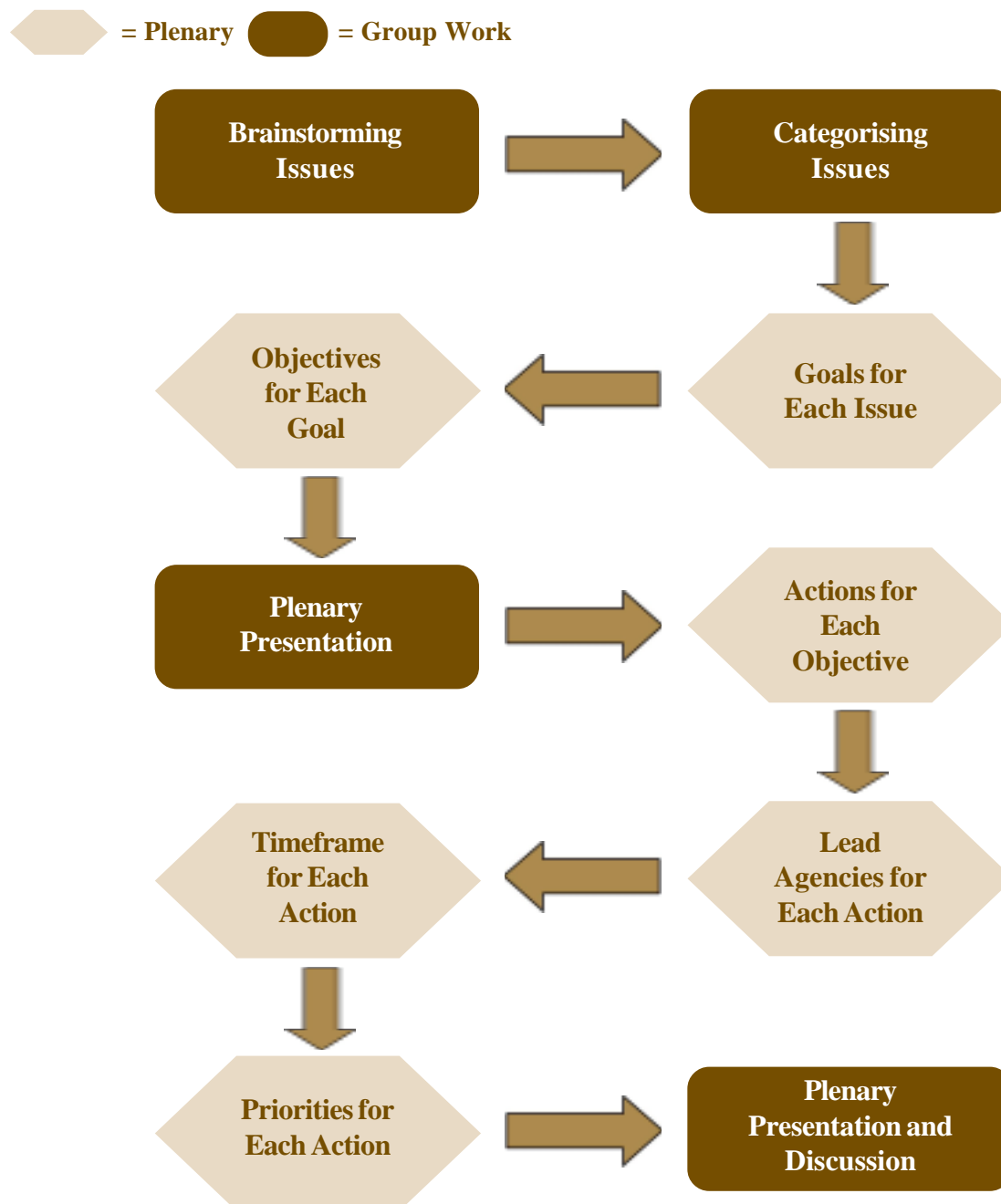


Figure 2. Diagrammatic representation of workshop process.

The Axolotl Species Habitat Action Plan

Elements affecting *Ambystoma mexicanum* and its habitat: specifying goals

The following eight broad subject categories were distilled from a list composed by all participants, the associated goals identified, and then set by consensus.

Topics and actions for the conservation of the axolotl

1. **Biology of the species**
 - a. Increasing knowledge of the species.
 - b. Ensuring the recovery of the wild population.
 - c. Promoting breeding centers for conservation.
2. **Ecological interactions**
 - a. Understanding the relations of the species with biotic and non-biotic factors.
 - b. Controlling and regulating exotic species.
3. **Legislation**
 - a. Having effective and adequate legislation for the conservation of the species and its habitat.
4. **Social**
 - a. Recovering the identity of the community with respect to the axolotl.
 - b. Uniting different sectors for conservation.
 - c. Increasing awareness of and participation of the community in conservation.
5. **Political**
 - a. Ensuring the participation of the different sectors in the decision making process.
 - b. Ensuring that the strategies of conservation are respected by the actions of the government.
6. **Environment**
 - a. Guaranteeing a suitable habitat for the axolotl.
 - b. Identifying and evaluating biotic and abiotic factors that affect the axolotl.
 - c. Reconciling biological, social and cultural elements.
7. **Education**
 - a. Revaluating the species in cultural and environmental terms.
 - b. Creating widespread awareness and understanding of the problematic at all levels (local, tourism, national and international).
8. **Uses**
 - a. Evaluating the uses of the axolotl.
 - b. Evaluating the cultural, social and economic importance of the axolotl.
 - c. Developing means and methods of making sustainable use of the species.

For each of these goals the workshop:

- ❖ identified actions to address these goals;
- ❖ identified the lead agencies to carry these actions out; and where time allowed,
- ❖ prioritised these actions (1-3 with 1= highest priority); and,
- ❖ estimated the timeframe required to execute them (short=1-2yrs, medium=2-5yrs, long =more than 5yrs).

Table 2. Biology of the species

Goal 1. Increasing knowledge of the species			
Actions	Lead Agencies	Time-frame	Priority
◆ Promote studies for the characterization of the ecological niche of <i>Ambystoma mexicanum</i> .	Chinamperos, Remeros, Fishermen, UNAM, CIBAC, DGZCM.	Short	
◆ Perform monitoring of <i>Ambystoma mexicanum</i> every 2 years in demographic terms.	UNAM.	Long	
◆ Identify populations in Lake Xochimilco and protect them.	CIBAC, UNAM.	Short	

Table 2. Biology of the species continued...

◆ Perform a demographic study of the populations of Chalco, Tlahuac and Mixquic.	CIBAC, UNAM.	Medium	
◆ Determine tolerance levels to biotic and abiotic factors (in situ and ex situ).	DGZCM, UNAM, CIBAC, UAM.		
◆ List the main pathogenic agents for <i>A. mexicanum</i> under natural conditions and in captivity and understand the susceptibility to these in different life stages.	International colonies, DGZCM, UNAM, UAM, CIBAC.	Medium	
◆ Extend the medical knowledge of the species: preventive medicine, diagnosis and therapeutic methods.	International colonies DGZCM.	Long	
◆ Update knowledge of the degree of genetic variability of <i>Ambystoma mexicanum</i> in its natural population.	UNAM?	Medium?	
◆ Join the already established workgroups.	GAA, GIAX.	Short	
◆ Create an “ambystoma” workgroup that performs common goals.	UAM, UNAM, DICE, INE, ARIZONA, ONGs (Rowers, Voces del Agua, PEX), IAC, CONABIO, SEMARNAT.	Short	1
◆ Create an advisory group for the actions.	CORENA, SEMARNAT, DX.	Medium	
◆ Advance and share the knowledge on breeding in captivity.	CIBAC, DGZCM, UNAM.	Short	
Goal 2. Recovering the Wild Population			
◆ Reduce exotic “predatory” species.	GIAX.	Long	2
◆ Generate a map to define “core zones”.	GIAX.	Long	1
◆ Study the size and structure of the wild populations.	GIAX.	Long	2
◆ Study isolated populations.	GIAX.	Long	3
◆ Create programs to eliminate the risk to reintroductions:	Chinamperos DICE	Short	
i. Control of exotic species (carp, tilapia)	Rowers, UNAM,		
ii. Control of excessive capture	Fishermen, CORENA,		
iii. Eliminate endogamies of introduced organisms	CONANP, SMADF,		
iv. Guarantee that reintroduced organisms are free of diseases.	DGZCM.		
◆ Evaluate the viability of reintroduction.	UAM, UNAM Delegational Government of Mexico City.	Short	
◆ Create controlled areas for repopulation.	DGZCM, CIBAC,	Long	
i. Promote egg laying areas.	CORENA, CONANP,		
ii. Protect most vulnerable stages.	SEMARNAT.		
◆ Create controlled areas for wild organisms.	CIBAC, CONANP, CORENA, PEX.	Long	
Goal 3. Promoting Breeding Centers for Conservation			
◆ Certify the breeding centers.	National Colonies, SEMARNAT	Short	
◆ Advise and/or train the personnel in these centers.	Technical subcommittee of Ambystoma (ST-A)	Medium	
◆ Request periodic reports of their activities.	Spread the result of the information to the community	Short	
◆ Organise a meeting of those responsible (annual)	Technical Subcommittee of Ambystoma(ST-A)	Short	

Table 2. Biology of the species continued...

◆ Explore financing and self-sustenance.	Pronatura funds.	Medium	1
◆ Obtain funds (local, national and international).	Private initiative.		
◆ Generate a genetic pool (national and international).	GIAX, SEMARNAT, DGZCM, CIBAC, UNAM.	Long	

Table 3. Ecological Interactions

Goal 1. Understanding the relations of the species with biotic and non-biotic factors			
Actions	Lead Agencies	Time-frame	Priority
◆ Research the impacts of threats on the axolotl population (pollution, exotic species, extraction, etc.).	CIBAC, UNAM, UAM, DGZCM.	Short	2
◆ Evaluate the impacts on the different life stages.	UNAM.	Long	2
◆ Research relevant trophic chains.	UNAM.	Short	2
◆ Research energy flows.		Long	
◆ Research the ecological role of the axolotl.		Long	
◆ Develop predictive model of the system using GIS.		Medium	3
◆ Gather all the available information (published, in thesis, etc) and spread it.	CIDEX, UAM-X, UNAM, CONABIO and Universities.	Short	1
Goal 2. Controlling and regulating of exotic species			
◆ Determine uses of exotic species for the community.	GIAX.	Short	1
◆ Evaluate different methods to deal with exotic species of Xochimilco.	GIAX.	Medium	2
◆ Define the most adequate method of control.	GIAX.	Medium	3
◆ Determine the role of the different ecosystems in Xochimilco for the lake dynamics and in particular, of the axolotl.		Long	3
Table 4. Legislation			
Goal 1. Having effective and adequate legislation for the conservation of the species and its habitat			
Actions	Lead Agencies	Time-frame	Priority
◆ Generate support and incentives at the international level.	Senate and congress, INE, CONABIO, Organization of the SAGARPA, DGV, SEMARNAT. (IUCN, red book, CITES).		
◆ Develop a Management Plan of the Natural Protected Area		Long	
◆ Modify the status of the species within the official Mexican standard of vulnerable and endangered species (NOM-059-SEMARNAT-2001), as well as the IUCN red list, and the CITES appendices.	CONABIO		1
◆ Bring together communities and NGOs to learn about needs and local traditions.	CORENA, PEX	Short	
◆ Know and update CORENA's management plan.		Short	
◆ Take petitions to the senate and congress.	SAGARPA, SEMARNAT, INE, CONABIO.	Short	

Table 5. Social

Goal 1. Recovering the identity of the community with respect to the axolotl				
Actions	Lead Agencies	Time-frame	Priority	
♦ Evaluate the current situation regarding the identity of the community (perform questionnaires, interviews, etc.).	GIAX, UMBRAL, PEX, Rowers, Fishermen, Chinamperos.	Medium	2	
♦ Organise meetings/workshops to establish communication and exchange information among the community, academic sector, government and others.	ST-A.	Medium	3	
♦ Conduct a campaign of sensitization (workshops, pamphlets, promotion through radio, TV, roadside advertisements, comics, contests, others. With schools, pet-owners, captive breeders.	ST-A, DGZCM.	Medium	3	
Goal 2. Uniting Different Sectors for Conservation				
♦ Select a “facilitator” to be the link between the community, academic and government sector to allow the continuous exchange of information. ST-A Subcommittee of Ambystoma can play an important role and even act as such (an “advising committee can be made, specifically for Xochimilco).	GIAX.	Short	1	
Goal 3. Developing awareness and participation of the community in conservation				
♦ Identify the key people (actors) of each group of the community, the subcommittee, government, academy and others involved.	ST-A, GIAX	Short	1	
♦ Contact the “key” actors, explaining what needs done, the results of the workshop and putting them together.	ST-A, GIAX	Short	2	
♦ Establish “The day of the Axolotl”; using a logo or mascot (defined by contest) and use that day to get all the actors together to perform activities focused on creating conscience, educating, exchanging ideas and information, etc.	DX, ST-A, DGZCM, CIBAC	Long	3	

Table 6. Political

Goal 1. Ensuring the participation of the different sectors in the decision making process				
Actions	Lead Agencies	Time-frame	Priority	
♦ Identify social actors.	DI, UAM, UNAM, Delegation.	Short	1	
♦ Promote the formation and organization of groups and the active participation of the community in necessary activities.	DI, Delegation, Community, PUMAS.	Short/ Medium	3	
♦ Create an invigilating committee to check the correct distribution.	Ambystoma Group, Community, DX.	Medium	3	
Goal 2. Ensuring that the strategies of conservation are respected by the actions of the government				
♦ Create links with the authorities and promote a healthy relationship to participate with them integrating groups like “Ambystoma” and the community of resources.	DX, DI	Medium	2	

Table 6. Political continued...

◆ Promote the formation of interdisciplinary groups that foster the adequate use of resources and inform of the effects of the species and cultivation, fishery and other techniques in Xochimilco. (These groups must participate in the decision making processes).	DI., Social Actors, Xochimilco Delegation, ST-GIAX, AdA.	Short	2
◆ Create a local interdisciplinary group to gather ideas and needs of the community and take these to the decision makers.	Facilitator.	Short	2

Table 7. Environment

Goal 1. Guaranteeing a suitable habitat for the axolotl			
Actions	Lead Agencies	Time-frame	Priority
◆ Obtain hydrological maps of the canals that detail the main affluent and current flow.	CNA, CORENA, DX, UNAM Rowers, Chinamperos.	Short	1
◆ Perform analyses to determine the quality of the water in the canal system and promote its cleanup and control.	CIBAC, UNAM, CNA, DX.	Short	1
◆ Perform regular monitoring of the water quality.	CNA, DX, CIBAC, UNAM, UAM.	Medium	3
◆ Perform regular investigations of the water quality.	CIBAC, UAM, UNAM, DX.	Short	2
◆ Perform regular monitoring of the quality of the sediment.	UNAM.	Medium	3
Goal 2. Identifying and evaluating biotic and abiotic factors that affect the axolotl			
◆ Perform investigations that determine the diversity, distribution and abundance of all endemic and exotic species.	CIBAC, UNAM, UAM, DICE.	Short	2
i. Generate a list of plants			
ii. Generate a list of plankton (zoo and phyto)			
iii. Generate a list of exotic species			
iv. Generate a list of bacteria (MO).			
◆ Determine the effect of these species on the axolotl (interactions) and eradicate or promote the development of these species.	UAM, CIBAC, UNAM, DICE, SEMARNAT, Rowers, Fishermen, DX.	Short	3
◆ Support Group Ambystoma – legal value and continuity.		Medium / long	3
Goal 3. Reconciling biological, social and cultural elements			
◆ Connect the results with international legislation.	SEMARNAT, CONABIO.		
◆ Promote the use of natural pesticides and fertilizers.	SEMARNAT, CONABIO, DX.		
◆ Perform workshops (all levels) giving greater emphasis to the areas or establishment of the axolotl (environmental education).	CIBAC, PEX, DGZCM, DICE.	Medium	3
◆ Determine risk and use zones in Xochimilco.	CORENA, DX.	Medium / long	3
◆ Perform investigations both in-situ and ex-situ about the	UAM, UNAM, DGZCM	Medium	3

axolotl to determine the effects of the conditions “in” the system. CIBAC, DICE, Chester Zoo.

Table 8. Education

Goal 1. Reevaluating the species in cultural and environmental terms				
Actions	Lead Agencies	Time-frame	Priority	
♦ Evaluate the attitudes and knowledge about the axolotl amongst people from Xochimilco.	DI, PEX, CIBAC.	Short	✓	
♦ Rescue myths, legends and history on the axolotl.	PEX, CIBAC.	Medium	2	
♦ Recognize the axolotl as a symbol of regeneration of Xochimilco.	All.	Short	1	
♦ Have a team of docents conscious and educated in respect to the conservation of the axolotl.		Long	1	
♦ Make the axolotl widely known as a friendly organism with an incredible biology.	CIBAC, PEX, GDF.	Medium	2	
♦ Create understanding in people about the importance of the interaction of the axolotl with its Medium.				
Goal 2. Creating awareness and understanding of the 'problem' at all levels (local, tourism, national and international)				
♦ Create understanding on the fishermen that render tourist services.	UNAM, DX.	Short		
♦ Make the ecological importance of the axolotl known.	CIBAC, PEX, GDF, DGZCM, DI.	Medium	1	
♦ Incorporate the problematic and importance of the axolotl in formal and non formal education.	Ministry of education, SEMARNAT.			
♦ Encourage all stakeholders to consider the axolotl as their own.	CIBAC, PEX.			
♦ Gather icons, symbols related to the axolotl – Appendix 5.	All.			

Table 9. Uses

Goal 1. Evaluating uses				
Actions	Lead Agencies	Time-frame	Priority	
♦ Study the existing market for the associated studies, uses and resources.	FAUNAM, UNAM.			
♦ Gather data regarding the scientific uses of the axolotl.	GIAX.	Medium	1	
♦ Gather data regarding the traditional uses of the axolotl.				
Goal 2. Evaluating importance				
♦ Establish the axolotl as international symbol of Xochimilco.	Local: PEX, UAM, DX.	Medium	1	
♦ Employ the axolotl as a teaching tool of the natural system of Xochimilco.	Global: CONABIO, SEMARNAT, UNAM.			
♦ Use the axolotl as a scientific tool.				
♦ Promote the diversified use of the axolotl.				
♦ Use the axolotl as a tool to get funds for the conservation of Xochimilco.				
♦ Evaluate current and potential economic importance.	FAUNAM, UNAM.	Medium	1	
♦ Study its economic importance due to aggregated value/ economic benefits.	FAUNAM, UNAM			

Table 9. Uses continued...

- ◆ Identify the socio-cultural importance of the axolotl. DICE, UAM?

Goal 3. Developing means and methods of making sustainable use

- | | | | |
|---|------------------------------------|--------|---|
| ◆ Establish a “sustainable use task force”. | DICE, UAM? | | |
| ◆ Promote the use and sustainable management of the axolotl and associated resources. Promote the diversified use of the axolotl. | Sustainable Use Task Force. | | |
| ◆ Research the possibility for the market and the product. | UAM, DETON, FAUNAM, UNAM. | Medium | 2 |
| ◆ Control the ‘sale’ of the species and information (community and tourism). | | | |
| ◆ Conduct feasibility studies for sustainable production. | FAUNAM, UNAM. | | |
| ◆ Integrate the use of the axolotl to the system of diversified production. | SEMARNAT, GDF, UNAM, UAM, SAGARPA. | Long | 3 |
| ◆ Set up a commercial production unit. | Investors | | |

Funding and Partnerships

A key position of responsibility distinguished by the term ‘facilitator’ was identified (see Tables 3 and 5), but no decision was made as to who s/he should be, from which agency s/he should come, and from where s/he should be resourced.

The workshop did not have sufficient time to comfortably explore the subject of funding and partnerships, so it was agreed that participants would make some suggestions on both of these issues in their feedback on the draft. Some suggestions on partnerships are included below. It is hoped that the recent Senate vote (Appendix 5) will help precipitate additional support for the implementation of this plan. Unfortunately, the key issue of funding had remained largely unaddressed.

Partnerships for Implementing the Axolotl S/HAP

Establishing effective partnerships is one of the most important phases of the action plan process. In addition to identifying partners it is essential to ensure a common understanding of the purpose of the process, the respective roles of partners and methods of working. This will establish some basic principles such as those relating to:

- ❖ Decision-making processes.
- ❖ Identifying responsibilities.
- ❖ Links with other plans or strategies.
- ❖ Communication within the partnership.
- ❖ Communication outside the partnership.
- ❖ Relationship to other fora (notably Local Agenda 21).
- ❖ Resources (expertise, time and finances).
- ❖ Timescale.
- ❖ Monitoring arrangements.

There are a number of key principles to be kept in mind when developing a successful partnership for the biodiversity planning process.

- ❖ Concentrate on those who can best ensure action and undertake tasks.
- ❖ All partners need a shared objective.
- ❖ Effective and regular communication within the partnerships, and within each organisation, will be needed, so a mechanism established quickly.
- ❖ Every partner should have a clearly defined role, including the resources they intend to contribute.
- ❖ The recognition that members of the partnership, and their respective roles will change over time

- means that a regular review must be conducted and involvement altered accordingly.
- ❖ Some partners will have their interests affected by the action plan process.

Key players will come from a range of sectors, which might include additional ones to those already involved in the S/HAP process: local authorities; land owners and managers; statutory environmental agencies; government offices, local community organizations; voluntary conservation organizations; academia; water management bodies; industry and commercial interests. Not all partners will have the same level of involvement; most are likely to focus on some particular elements of the plan – so it is crucial that participants are clear about their contribution.

Monitoring, Evaluation and Review

Evaluation is a vital component of any Action Plan and is of greatest value if it is thought about at the outset and integrated throughout the design and implementation process. Since the goals and actions in this S/HAP are clearly stated it should be quite straightforward to devise means of assessing how they have been met. The suggestion is that a variety of mechanisms be employed, including questionnaires, focus groups/panels, individual interviews, observation of specific activities, and a review of publications and other written records. Clearly, one organisation would have to take the co-ordinating role in this process. Perhaps the organisation set up by the Darwin Initiative project (GIAX = Grupo de Investigacion de Ajolote y Xochimilco) would be best placed to do this. ❖



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Appendix 1 - Abbreviations Used in Text

AdA	Amigos del Ajolote (Friends of the Axolotl - <i>presently does not exist</i>)
BHS	British Herpetological Society
CIBAC	Centro de Investigaciones Biologicas y Acuicolas de Cuema
CIDEX	Centro de Información y Documentación Especifico de Xochimilco
CNA	Comision Nacional del Agua
CONABIO	Comision Nacional de la Biodiversidad
CORENA	Comisión de Recursos Naturales y Desarrollo Rural
DAPTF	Declining Amphibian Population Task Force
DEFRA	Department for Environment, Fisheries and Rural Affairs
DGVS	Dirección General de Vida Silvestre
DGZCM	Dirección General de Zoológicos de la Ciudad de México
DICE	Durrell Institute of Conservation and Ecology
DX	Delegacion Xochimilco
GIAX	Grupo de Investigacion de Ajolote y Xochimilco
GDF	Gobierno del Distrito Federal
INE	Instituto Nacional de Ecología, SEMARNAT
PEX	Parque Ecológico, Xochimilco
PUMA	Programa Universitario del Medio Ambiente
SAGARPA	Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación
SEMARNAT	Secretaría de Medio Ambiente y Recursos Naturales
ST-A	Subcomité Técnico Consultivo Nacional para la Conservación, Manejo y Aprovechamiento del Género <i>Ambystoma</i> .
UAM-X	Universidad Autónoma Metropolitana, Unidad Xochimilco
UNAM	Universidad Nacional Autónoma de México.

Appendix 2 - Seminario / Taller Programa

Lunes, 6 Diciembre - Presentaciones I

- 09:00-09:30 Llegada y registro.
- 09:30-09:45 Bienvenida: Norberto Alvarez, Rector, UAM-X.
- 09:45-10:00 Introducción al seminario/taller, Gerardo García (Moderador - y Head of Herpetology Department, Durrell Wildlife Conservation Trust).
- 10:00-10:30 The British Government's Darwin Initiative project: Richard Griffiths (DI Project Director, DICE – Durrell Institute of Conservation and Ecology).
- 10:30-11:00 Introducción y perspectivas de los participantes – ejercicio (Gerardo García, DWPT).
- 11:00-11:30 Refrescos.
- 11:30-12:00 El potencial del turismo basado en la naturaleza en Xochimilco: Alejandro Meléndez (Co-ordinator Proyecto DI, UAM).
- 12:00-12:30 El ajolote y Xochimilco - presente y futuro de su investigación: Luis Zambrano (Investigador, Instituto de Biología, UNAM).
- 12:30-13:30 Comida.
- 13:30-14:00 Poniendo en práctica la Convención sobre la Diversidad Biológica: Hesquiu Benitez (CONABIO).
- 14:00-14:30 El ajolote y CITES: Paola Mosiq Reidl (Dirección de Enlace y Asuntos Internacionales, CONABIO).
- 14:30-15:00 La planificación del paisaje en la conservación de la naturaleza en Xochimilco: Juan Manuel Chavez (Investigador, UAM).
- 15:00-15:30 Preguntas y discusiones.

Martes, 7 Diciembre - Presentaciones II

- 09:00-09:30 Programa Interno de Conservación de Especies - El Ajolote de Xochimilco: (Representante, Zoo de Chapultepec).
- 09:30-10:00 El estado de diferentes especies y las consecuencias para el ajolote: Eduardo Peters (Director de Conservación de los Ecosistemas, INE - Instituto Nacional de Ecología, SEMARNAT).
- 10:00-10:30 Trabajando con la comunidad: Erwin Stephan-Otto (Director PEX).
- 10:30-11:00 The role for captive breeding of the axolotl: Jeanne McKay (International Co-ordinator, DAPTF).
- 11:00-11:30 Refrescos.
- 11:30-12:00 El diseño eco-regional y la conservación del ajolote en Xochimilco: Josefina Resendiz (Investigador, Instituto de Diseño y Tecnología, UAM).
- 12:00-12:30 Raising the flagship: Kevin Buley (Curator of Reptiles, Amphibians and Fish, North of England Zoological Society, Chester Zoo).
- 12:30-13:30 Comida.
- 13:30-14:00 El papel del CIBAC en la conservación del ajolote y su hábitat: Fernando Arana (Director CIBAC)
- 14:00-14:30 Public education and participation - Xochimilco's remeros: Ian Bride (Project Officer, DICE).
- 14:30-15:30 Taller plenario. Ejercicio de estructuración: identificando temas clave y componentes que desarrollen el Plan de Acción para el *Ambystoma mexicanum* y su Hábitat.

Miércoles, 8 Diciembre - Taller I

- 09:00-09:30 Reglas del taller.
- 09:30-10:30 Ejercicio de Grupo – Hechos o Ficciones: Sesión de exploración de los elementos que afectan la conservación del *Ambystoma mexicanum* y su hábitat.
Group exercise - Facts or Fictions: brainstorming the elements affecting the conservation of *Ambystoma mexicanum* and its habitat.
- 10:30-11:30 Sesión plenaria – Hechos o ficciones: Informando y evaluando
Plenary – Facts or Fictions: reporting and assessing.

11:30-12:00	Refrescos. Ejercicio de Grupo – De Ficciones a Hechos: especificando metas Group exercise - Fictions to Facts: specifying goals.
12:00-13:00	Sesión plenaria– De Ficciones a Hechos: Informando y evaluando
13:00-13:30	Plenary – Fictions to Facts: reporting and assessing.
13:30-14:30	Comida.
14:30-15:30	Ejercicio de Grupo – Acciones para conseguir metas Group exercise – Action to achieve goals.
16:00-18:00	Actividad Extra – Paseo en trajinera en el Lago Xochimilco.

Jueves, 9 Diciembre - Taller II

09:00-09:30	Ejercicio de Grupo – Acciones para lograr las metas Group exercise – Action to achieve goals.
09:30-10:00	Sesión plenaria – Acciones para lograr las metas: Informando y evaluando Plenary – Identifying lead agencies and timeframes: reporting
10:00-10:45	Ejercicio de Grupo – Identificando organismos líderes Plenary– Action to achieve goals: reporting.
10:45-11:15	Refrescos.
11:15-11:45	Ejercicio de Grupo – Escala de tiempo Group exercise - Timeframes.
11:45-12:00	Sesión plenaria – Identificando organismos líderes y escala de tiempo: Informando y evaluando Group exercise - Identifying lead agencies.
12:00-13:00	Comida
13:00-13:15	Ejercicio de despertar: A's and B's Wake up exercise: A's and B's.
13:15-14:00	Ejercicio de Grupo – Financiación y asociaciones Group exercise - Funding and partnerships.
14:00-14:15	Sesión plenaria - Financiación y asociaciones: Informando y evaluando Plenary - Funding and partnerships: reporting.
14:15-15:30	Sesión plenaria – El marco del S/HAP Plenary - The S/HAP framework.
15:30-16:00	Reacciones sobre el Taller. Agradecimientos y despedida. Workshop feedback, thank you and goodbye.

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(Those Who Left Their Details)

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Appendix 4 - Axolotl Education - Suggested Activities

Actions	Lead Agencies	Timeframe	
Reevaluating the species in cultural and environmental terms			
❖ Art competition ⇒ 2006 calendar	DI/PEX/BEm	Corto	✓
❖ Photography competition	IP, ONGs, SEMARNAT	Medio	3
❖ Painting books, story books	DI, DGZCM	Medio	2
❖ Festivals - “El dia del Ajolote” – “Day of the axolotl”	Del. Sec. Turismo, GDF, SEMARNAT	Largo	3
❖ Materials for teachers	SET, Zoos, ONGs Educ, UAM, UNAM, SEMARNAT	Medio	2
❖ “Labeling” the embarcadero Cuemanco + the remero football team with the axolotl	DI, Chester Zoo?	Medio	3
❖ Remero/artisan workshops	DI	Corto	1
❖ Website	GIAX UAM, UNAM, CONABIO, SEMARNAT, INE	Corto	3
❖ Academic and popular articles	UAM, UNAM, DICE	Corto	2
❖ Visits to CIBAC, PEX, Chapultepec	los orgs.	Corto	2/3
❖ A group called “Friends of the axolotl” (AdA)	GIAX	Corto	3
❖ School visits	AdA	Largo	3
❖ Production of materials (posters, leaflets, souvenirs)	todos + artesanos	Corto	2
❖ TV documentaries	?	Largo	3
❖ Application for a RARE- Center Campaign	PEX	Medio	2
❖ The axolotl salute!	todos!	Largo	3

Appendix 5 - Senate Vote

Dictámenes a Discusión

De la Comisión de Medio Ambiente, Recursos Naturales y Pesca, el que contiene punto de acuerdo en relación con la extinción del ajolote en México.

Aprobado En Votacion Economica

No. 100Año 2005
Miércoles 16 de Marzo
2º Año de Ejercicio.
Segundo Periodo Ordinario

Dictamen A La Propuesta En Relación Con La Extinción Del Ajolote En México

Comisión De Medio Ambiente, Recursos Naturales Y Pesca

Honorable Asamblea

La Comisión de Medio Ambiente, Recursos Naturales y Pesca le fue turnada para su estudio y elaboración del dictamen correspondiente, la propuesta con Punto de Acuerdo en relación con la extinción del ajolote en México, presentado por la Senadora Leticia Burgos Ochoa, integrante del Grupo Parlamentario del Partido de la Revolución Democrática, para su estudio y elaboración del dictamen correspondiente.

Con fundamento en los artículos 94, párrafo I, y demás aplicables de la Ley Orgánica del Congreso General de los Estados Unidos Mexicanos; y 60, 87, 88 y demás aplicables del Reglamento para el Gobierno Interior del Congreso General de los Estados Unidos Mexicanos, los integrantes de la Comisión que suscribe, sometemos a la consideración del Pleno del Senado de la República el presente dictamen:

Antecedentes

Primero- El 15 de marzo de 2005 la Senadora Leticia Burgos Ochoa, integrante del Grupo Parlamentario del Partido de la Revolución Democrática presentó una propuesta con Punto de Acuerdo en relación con la extinción del ajolote en México.

Segundo.- En esta misma fecha, dicha propuesta con Punto de Acuerdo fue turnada a la Comisión de Medio Ambiente, Recursos Naturales y Pesca, de la LIX Legislatura de la Cámara de Senadores del H. Congreso de la Unión, para la elaboración del dictamen correspondiente;

Tercero.- Con fecha 15 de marzo del año en curso, los integrantes de esta Comisión dictaminadora procedimos a la elaboración del presente dictamen con base en las siguientes.

Consideraciones

La extinción de poblaciones y especies de plantas y animales constituye uno de los problemas más severos que enfrenta la humanidad que, además, es irreversible. El número de especies que desaparece de la faz de la Tierra es el resultado directo de nuestras actividades y es el preámbulo de problemas que pueden llegar a ser de proporciones inconmensurables.

Una de las especies de animales que se encuentran en peligro de extinción, dentro la gran cantidad que se encuentran en esta situación, es el ajolote del lago de Xochimilco, debido a depredadores, la recolección ilegal de especies y la contaminación.

Esa especie recibe el nombre científico del *Ambystoma mexicanum*, considerada como única en el mundo y es un anfibio de la familia de las salamandras, que constituye un eslabón importante en el ecosistema de Xochimilco y en el equilibrio ecológico del lugar.

Por ello, biólogos de la Universidad Autónoma Metropolitana (UAM) unidad Xochimilco y de la Universidad de Kent, en el Reino Unido, han unido esfuerzos para preservar la especie, y han recibido ayuda de la llamada *Iniciativa Darwin*, un proyecto de sustentabilidad y conservación ecológica y de la biodiversidad creado por el gobierno británico para colaborar en el rescate y preservación de especies en peligro de extinción en todo el mundo.

Este proyecto de sustentabilidad, ha proporcionado apoyo económico para un proyecto que comenzó en 2002 y que finalizará este año, el cual incluye la capacitación de los remeros de la localidad para crear un sistema de información dentro del llamado turismo naturista o ecológico y ayudar a la conservación del entorno.

El ajolote comenzó a padecer las obras del hombre cuando, a principios del siglo XX, los canales de Xochimilco, que se alimentan de manantiales subterráneos, fueron desviados por Porfirio Díaz para servir a la ciudad, y en su lugar se vertieron en el lugar aguas residuales desde las plantas de tratamiento ubicadas en el cerro de la Estrella y en la comunidad de San Luis Tlaxialtemalco.

Asimismo, este tipo de ajolotes ha sorprendido a los científicos europeos en su capacidad regeneradora, ya que además de desarrollar una nueva cola o un nuevo miembro que haya perdido por accidente o por la agresión de un depredador, también puede regenerar células del cerebro o del corazón.

Ante la proximidad de la conclusión de los estudios sobre el ajolote por parte del Reino Unido en el presente mes, el gobierno federal mexicano no ha mostrado preocupación por continuar con la importante obra de su conservación.

Considerando lo anteriormente expuesto, la Comisión que suscribe coincide con los señalamientos expresados en la propuesta analizada por lo que somete a la consideración del Pleno de la Cámara de Senadores del Honorable Congreso de la Unión el siguiente:

Punto De Acuerdo

Unico.- La Cámara de Senadores del Congreso de la Unión solicita al titular del Ejecutivo Federal instruya al Secretario de Medio Ambiente y Recursos Naturales para que, conjuntamente con la Universidad Autónoma Metropolitana y la Universidad de Kent, Inglaterra, active urgentemente un programa gubernamental para evitar la extinción de la especie *Ambystoma mexicanum* o ajolote del lago de Xochimilco.

Dado en el Salón de Plenos de la Honorable Cámara de Senadores el día 15 de marzo de 2005.

Comisión De Medio Ambiente, Recursos Naturales Y Pesca

Sen. Verónica Velasco Rodríguez

Presidenta

Sen. Víctor Manuel Méndez Lanz

Secretario

Sen. Héctor Larios Cordova

Secretario

Sen. Óscar Cantón Zetina

Sen. Adalberto Castro Castro

Sen. José Carlos Cota Osuna

Sen. Jorge Abel López Sánchez

Sen. Eduardo Ovando Martínez

Sen. Micaela Aguilar González

Sen. Jorge Rubén Nordhausen González

Sen. Víctor Manuel Torres Herrera

Sen. Leticia Burgos Ochoa

Sen. Ricardo Gerardo Higuera

Sen. Antonio Santisteban Ruiz

Sen. Emilia Patricia Gómez Bravo

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UNAM



BRITISH
HERPETOLOGICAL
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BRITISH
COUNCIL



Toronto Zoo