

AQUATIC MAMMALS IN LATIN AMERICA: Proceedings of a Workshop on Identifying High-Priority Conservation Needs and Actions

Held in Valdivia, Chile, between 18 and 19 October, 2002



Edited by:

Rodrigo Hucke-Gaete, Enrique A. Crespo & Roberto P. Schlatter

Contributors:

Silvana Dans, Ann Katrien Lescrauwaet, Fernando Trujillo, Eduardo Secchi, Daniel Palacios, Jorge Urbán, Anelio Aguayo, Ignacio García-Godos, and all participants of the 10th Workshop of South American Specialists on Aquatic Mammals and 4th Conference of the Latin American Society of Aquatic Mammal Specialists.

Convention on the Conservation of Migratory Species of Wild Animals

United Nations Premises in Bonn, Martin-Luther-King Str. 8, D-53175 Bonn, Germany,
Tel: (+49 228) 8152401; Fax: (+49 228) 815 2449; E- mail: cms@cms.unep.de



AQUATIC MAMMALS IN LATIN AMERICA: Defining high-priority conservation needs and actions

TABLE OF CONTENTS

INTRODUCTION	1
AGENDA ITEM 1. OPENING OF THE WORKSHOP	2
AGENDA ITEM 2. ADOPTION OF THE AGENDA	2
AGENDA ITEM 3. REVIEW OF THE TERMS OF REFERENCE	2
AGENDA ITEM 4 & 5. CONSERVATION STATUS OF AQUATIC MAMMALS IN LATIN AMERICA: OVERVIEW OF KNOWN OR PRESUMED IM PACTS BY REGION	4
Region 1. Caribbean	4
Region 2. Western Tropical Pacific	5
Region 3. Western South Atlantic	6
Region 4. Southern South America	7
Region 5. Eastern South Pacific	8
Region 6. Eastern Tropical Pacific	9
AGENDA ITEMS 6 & 7. DISCUSSION AND PRIORITISATION OF NEEDED ACTIONS	10
Continental roundup	10
Region-wide conservation strategy	13
Regional prioritisation of needed actions	17
Proposed concerted actions (regional and multi-regional)	20
AGENDA ITEM 8. OTHER BUSINESS & CLOSE OF THE WORKSHOP	24
APPENDICES	
APPENDIX A: Workshop Agenda	25
APPENDIX B: Proposed sub-regions for discussion of known or presumed conservation problems affecting aquatic mammals in Latin America	27
APPENDIX C: List of participants	28
APPENDIX D: List of background documents	31
APPENDIX E: List of Latin American aquatic mammals included in CMS's Appendices	33
ACKNOWLEDGEMENTS	34

Suggested citation of this report:

Hucke-Gaete, R., E. Crespo & R. Schlatter (Eds.) (2004). Aquatic mammals in Latin America: Proceedings of a workshop on identifying high-priority conservation needs and actions. UNEP/CMS Secretariat, Bonn, Germany. 35 Pp.

INTRODUCTION

Much like the problems faced by aquatic mammals elsewhere in the world, those faced by marine and freshwater mammals in Latin America (defined here as the region including Mexico, Central America, the Caribbean and South America) include incidental mortality in fisheries, direct exploitation, degradation and loss of habitat, and competition with humans for marine and freshwater resources (Reeves *et al.* 2003). For most aquatic mammal species inhabiting these waters, quantitative information on basic biology, abundance and trends is still limited or inexistent and thus our capacity to quantitatively evaluate and address human-induced conservation threats and implement conservation measures to protect certain populations and the marine ecosystems they depend on becomes restricted.

Due to this lack of information, the Convention on the Conservation of Migratory Species of Wild Animals (CMS) encouraged the preparation of a *Review of the Conservation Status of Small Cetaceans in Southern South America* which was subsequently published in the year 2000. The preparation of this document brought together a number of South American researchers who reviewed existing information on small cetaceans distributed in the region, their conservation status and the possible threats they are facing, and also provided recommendations for regional actions. Since this review was completed in 1998 but only published in 2000, it seemed appropriate to join efforts again in order to review and discuss new information regarding current conservation threats and research progress, further identify high-priority conservation actions and explore prospects for continued regional cooperation, this time including other migratory aquatic mammals such as large whales, sea lions, seals, manatees and otters.

This new initiative was supported by CMS and crystallized as a two-day special workshop held in Hotel Villa del Río, Valdivia, Chile from 18 to 19 October, 2002. This workshop was included in the official program of the 10th Workshop of South American Specialists on Aquatic Mammals and 4th Conference of the Latin American Society of Aquatic Mammal Specialists (SOLAMAC).



AQUATIC MAMMALS IN LATIN AMERICA: Defining high-priority conservation needs and actions

AGENDA ITEM 1. OPENING OF THE WORKSHOP

The workshop was convened by Dr. (c.) R. Hucke-Gaete (Chile) and was co-chaired by Dr. E. Crespo (Argentina – IUCN Cetacean Specialist Group) and Dr. R. Schlatter (Chile – CMS Councillor for the Neotropics). Nineteen out of the 23 researchers officially invited to attend and participate on the workshop received partial financial support from CMS.

AGENDA ITEM 2. ADOPTION OF THE AGENDA

Drs. Crespo, Schlatter and Hucke-Gaete were proposed to serve as coordinators of the discussions and the motion was approved by the plenary. Dr. Crespo welcomed participants and outlined the program for the meeting. He further noted that in consultation with invited participants a few changes had been made on the initial Agenda. These changes included the cancellation of the initially proposed “closed sessions” in order to incorporate and discuss fresh ideas and approaches with a wider audience. This change involved modifying the initially established sub-regional presentations lectured by invited participants with the establishment of sub-regional round tables (see Appendix A). Regional subdivisions were also modified from the original agenda and plenary discussions resulted in the arbitrary definition of six sub-regions (see Appendix B). These modifications were approved by the plenary.

AGENDA ITEM 3. REVIEW OF THE TERMS OF REFERENCE

On day one (18 October) participants were welcomed by the chairs and convenor of the workshop and reflections were made on the work of CMS on behalf of aquatic mammal conservation. Dr. (c.) Hucke-Gaete explained the terms of reference of the workshop and Dr. Schlatter gave details on the approach of CMS to conserving migratory species. He also referred to current issues discussed during the development of CoP7 and strongly recommended the CMS approach into developing joint conservation actions between countries in order to address common problems. He invited countries not yet parties to join the Convention in view of the benefits for conserving aquatic mammals together with riverine, marine coastal and offshore habitats.

Following Dr. Schlatter’s presentation, Dr. Crespo introduced IUCN’s *2002-2010 Conservation Action Plan for the World’s Cetaceans* (2003). He briefly explained the documents’ contents, chapter by chapter, and specifically referred to relevant problems and recommendations for cetaceans in Latin America. The main purpose of this presentation was to guide subsequent discussions towards priority conservation and research as identified in the IUCN document (after



AQUATIC MAMMALS IN LATIN AMERICA: Defining high-priority conservation needs and actions

extensive consultation with the world's leading authorities on the different issues). The wide approach of the document allowed the building up of further discussion including other aquatic mammals such as sea otters, manatees, seals and sea lions.

After introducing the IUCN document, Dr. Crespo presented and explained the new strategy of World Wildlife Fund (WWF) for reducing cetacean bycatch. He pointed out that a *Bycatch Network* had been created along with a Committee of Experts in the subject (<http://www.cetaceanbycatch.org>). He also mentioned that WWF had made a \$75,000 contribution to the International Whaling Commission (IWC) Small Cetacean Fund for developing research on different fishing gear and methods that allow the reduction of bycatch. Proposals should be submitted directly to the IWC. Finally he commented on the WWF program *Education for Nature*, which provides scholarships and professional development grants for researchers. Cetacean bycatch has been made a priority for this year.

Roundtables were announced and sub-regional coordinators as well as rapporteurs were elected. The following sub-groups were formed (see Appendix C):

Caribbean: D. Palacios (coord.), F. Trujillo & J. Urbán (rapps.).

Western Tropical Atlantic: F. Trujillo (coord.) & several rapporteurs.

Western South Atlantic: E. Secchi (coord.), M. Lázaro, M. Muelbert, M. Rollo, S. Siciliano & D. Szteren (rapps.).

Southern South America: S. Dans, K. Lescrauwaet (coords.), C. Boy, N. Goodall, S. Hooker, M. Lewis & M. Muelbert (rapps.)

Eastern South Pacific: I.A. García-Godos (coord.), A. Aguayo, C. Castro, M. Echegaray, M. Flores, C. Lippi, D. Palacios, M.J. Pérez, L. Rendell & W. Sielfeld (rapps.).

Eastern Tropical Pacific: J. Urbán (coord.), B. Mate & D. Palacios (rapps.).

The coordinators of the workshop simultaneously participated in discussions of different regional working groups and answer questions concerning the workshop objectives, while also handing out additional material from the CoP7 (concerning CMS Appendices and examples of concerted actions; see Appendix E).



AQUATIC MAMMALS IN LATIN AMERICA: Defining high-priority conservation needs and actions

On day two (19 October), sub-regional coordinators were invited to present the conclusions drawn from the previous day's discussion and comments were received from the audience. This session continued throughout the morning and part of the afternoon. Dr. Schlatter was commended to take note of the several aquatic mammal species that sub-regional groups suggested should be included in CMS's Appendices and the need to review current species listed in these, prioritize concerted actions carefully and develop Agreement proposals between countries for shared conservation problems, was stressed.

AGENDA ITEMS 4 & 5. CONSERVATION STATUS OF AQUATIC MAMMALS IN LATIN AMERICA: OVERVIEW OF KNOWN OR PRESUMED IMPACTS BY REGION

1. CARIBBEAN

The region has been heavily affected by exploitation and degradation of coastal ecosystems, mainly coral reefs, coastal lagoons and mangrove forests. Currently, tourism exerts an important and increasing pressure over the fragile ecosystem and potential oil extraction ventures add additional stress to the future sustainability of the marine ecosystem. This is particularly so in the Gulf of Maracaibo where in general, pollution levels are high due to oil prospecting and the presence of chemical industries. Discrete populations of tucuxis, *Sotalia fluviatilis*, depend on heavily exploited mangrove systems which make it particularly vulnerable throughout its range. Coastal dolphins suffer from incidental bycatch in artisanal gillnets as well as from directed catch to use their meat as bait in shark fisheries (*Sotalia*, *Tursiops*, *Stenella* and *Delphinus*). Other concerns include the low selectiveness of fishing gear which causes considerable impacts since these fishing areas are characterized by a relatively low productivity.

Marsh sedimentation and desiccation was considered to correspond to one of the main problems affecting the West Indian manatee, *Trichechus manatus*, during the dry season, when massive strandings occur due to this process. Proposals until now consider short term objectives and do not consider or outline adequate management strategies for these particular water bodies.



AQUATIC MAMMALS IN LATIN AMERICA: Defining high-priority conservation needs and actions

2. WESTERN TROPICAL ATLANTIC

It was recognized that available information is limited and that studies up to date have only focused on restricted geographic areas. It was also noted that conservation initiatives are limited to particular features of each country in the region, where political and social aspects such as military instability and limited economic growth may obstruct prospective monitoring and conservation programs. Roundtable participants agreed that many conservation threats are common to most species, however, it was decided that only some representative species would be treated in order to address specific problems.

On this regard, conservation threats that affect *Trichechus inunguis* (Amazonian manatee) mainly include habitat destruction and consequently, population isolation. Hydroelectric dam construction creates barriers and isolates local groups. This in turn affects gene flow and limits the ability of some groups to survive in a restricted and modified environment. In addition, loss of macrophytes by direct removal limits food availability for *T. inunguis* to give way to rice plantations and provide further access to riverside islands. Furthermore, oil spills, illegal hunting and lack of environmental awareness, coupled with uncontrolled population growth, increasingly restrict available habitat. This is particularly so during the dry season, when low water levels make *T. inunguis* especially vulnerable during their migration. Amazonia is a region characterized by well marked and pulsed hydrological cycles where water level differences can even reach 14m. Flooding periods generate supplementary habitat which is available for aquatic species that disperse widely and colonize different habitats. For *T. inunguis*, these flooding pulses induce seasonal movements between lakes and tributaries (high-water season) towards main rivers (during low-water seasons). These movements make these animals particularly vulnerable to hunting and poaching.

In the case of *Trichechus manatus* (West Indian manatee), several conservation threats are operating and including estuary and mangrove degradation (from deforestation and pollution) and illegal hunting and incidental capture in gillnet fisheries. Available information suggests that the species' distribution is becoming discontinuous and is also exhibiting a continuous decrease in population size. The only population estimate available for the region comes from Brazil with a remaining population of 500 individuals. *Trichechus manatus* populations from the Orinoco have only recently been evaluated; however, population discontinuity seems to also be a problem in this area. Successful implementation of adequate conservation policies and control has failed to become a reality.



AQUATIC MAMMALS IN LATIN AMERICA: Defining high-priority conservation needs and actions

Pteronura brasiliensis (giant river otter) and *Lontra longicaudis* (neotropical river otter) were identified to share similar conservation threats and were considered to be highly vulnerable to some anthropogenic activities such as illegal hunting and live captures for use as pets, mercury poisoning from gold mining, pollution from fossil fuel extraction and industrial development. In addition, these species suffer from an unfortunate reputation as competitors with local fisheries and aquaculture activities and are taken incidentally in gillnets. In the case of *P. brasiliensis*, viable populations are only believed to occur in Brazil (Amazonas and Pantanal), however, river course changes driven by industrial mega-projects directly affect the habitat on which this species depends (tributaries) and provoke population isolation together with local extinctions. Due to the extensive distribution of *L. longicaudis*, it has previously been assumed to be abundant; however, truth is that no population assessments have been undertaken and information regarding basic aspects of their biology is still lacking.

River and estuarine dolphins such as *Inia geoffrensis* (boto) and *Sotalia fluviatilis* (tucuxi) are also threatened by the various anthropogenic activities mentioned above, such as incidental and directed catch for use as bait in fisheries, damming of rivers, deforestation, pollution from gold mining operations and expanding urban centres, and in Colombia, oil spills caused by guerrilla bombing of oil pipes.

Superstitions surrounding these species (particularly *I. geoffrensis*) used to provide protection from hunting in many areas, however, the loss of traditional cultural values is reverting fishermen's attitudes towards the species. The problems outlined above provoke unknown levels of mortality, isolates segments of the population, reduces food supplies and habitat availability, and induces the bioaccumulation of chemical compounds in these higher trophic predators. The above is compounded with the small numbers of research groups which currently concentrate efforts only in small areas due to lack of economic resources.

3. WESTERN SOUTH ATLANTIC

Environmental threats that affect aquatic mammals in this region include degradation and loss of habitat resulting from overfishing (e.g. south of Brazil), mangrove destruction, chemical pollution coming from high demographic density, rapid expansion of urban areas that extend along the coastal border and are in proximity to protected areas, as well as acoustic pollution from extensive maritime traffic and seismic operations. In addition, potential risks that need special attention are those derived from oil prospecting and production, tourist activities that focus on marine mammal observation and on a local scale, aquaculture activities. Other identified threats correspond to



AQUATIC MAMMALS IN LATIN AMERICA: Defining high-priority conservation needs and actions

incidental captures in coastal and pelagic fishing activities that use bottom set gillnets in both coastal and oceanic regions, driftnets, trawls and longlines.

Many species of small cetaceans are taken incidentally in fisheries developed along the coastal border of Brazil, Uruguay and Argentina. Although *Pontoporia blainvillei* (franciscana) is the species of greatest concern, *S. fluviatilis* has also experienced relatively high levels of incidental mortality in some areas. Other species inhabiting these waters (e.g. *Tursiops truncatus* (bottlenose dolphin), *Phocoena spinipinnis* (Burmeister's porpoise), *Otaria flavescens* (South American sea lion) and *Arctocephalus australis* (South American fur seal) have been subject to incidental takes in lower numbers. Information is still almost entirely lacking on the number and species composition of the by-catches, fishery characteristics, and fleet dynamics for most of these areas.

4. SOUTHERN SOUTH AMERICA

Main threats affecting aquatic mammals in this region include incidental capture in industrial fisheries for squat lobster and hake and affects species such as *O. flavescens*, *Lagenorhynchus obscurus* (dusky dolphin), *Cephalorhynchus commersonii* (Commerson's dolphin) and *Delphinus delphis* (short beaked common dolphin) in Argentina. In southern Chile, the artisanal and industrial Patagonian toothfish fishery has been reported to interact with *Physeter macrocephalus* (sperm whales), *Orcinus orca* (killer whales), fur seals and sea lions. Recent studies have shown that operational interactions between marine mammals and this fishery involves low predation of fish from the line and also low incidental mortality from entanglement; however, directed mortality arising from the retaliatory actions employed by fishermen was considered to be worthy of special concern (particularly in the case of the artisanal fleet). In Chile, common practices of fishermen when a blow is seen at a distance, is that they do not set the line, but simply move to another place; however, if they are hauling, they cut the line, put a buoy, and set the line again. On other occasions, practices used to mitigate the problem include shooting, ramming or using explosives to deter the whales and sea lions. These practices result in injuries or death of the individuals that interact with the fishery. A matter of further consideration is that not only the species outlined above suffer from this negative interaction, but also other species present in the area given that few fishermen can distinguish between marine mammal species or are acquainted with basic aspects about their biology. This became evident only recently by a confirmed case of the near-ramming a group of eight *Balaenoptera musculus* (blue whale). This issue and the recent discovery of a large feeding and nursing ground for this species in southern Chile poses a great conservation concern for the population using these waters.



AQUATIC MAMMALS IN LATIN AMERICA: Defining high-priority conservation needs and actions

Also, incidental capture of aquatic mammals in artisanal fisheries that use gillnets in coastal waters have recently included *C. commersonii* (Chile/Argentina), *C. eutropia* (Chile), *Australophocoena dioptrica* (spectacled porpoise) (Argentina/Chile), *L. obscurus* (Argentina/Chile), *L. australis* (Peale's dolphin) (Argentina/Chile) and *P. spinipinnis* (Argentina/Chile). Direct takes of *O. flavescens*, *Arctocephalus* spp. and the injuring or killing *P. macrocephalus* and *O. orca* are currently a problem provoked by artisanal fishermen due to operational interactions with longline fisheries.

The rapid expansion of aquaculture activities (mainly for salmon and mussels) was also identified as an important source of habitat degradation and directed takes of aquatic mammal species inhabiting the region, mainly in the sheltered bays and fjords of southern Chile. Species most threatened by these activities correspond to coastal dolphins (*L. australis* and both species of *Cephalorhynchus* spp.), sealions and fur seals, *Lontra felina*, *L. provocax* (marine and river otters, respectively) and *Mirounga leonina* (elephant seals). The impacts from aquaculture activities and coastal urban areas are considered to be potentially severe and include over input of nutrients into the environment (mainly phosphorous and nitrogen) from fish faeces and unused food pellets, chemical pollution (antifouling; antibiotics) and marine debris (plastic bags and bottles, ropes and nets), together with increased boat traffic. In the particular case of otariids, salmon farmers undertake directed culling of nearby resting rookeries and also shoot the animals attacking or swimming in the vicinity of pens with the belief that this will release pressure from some familiarized sea lions which tend to attack the facilities in pursue of salmon. Currently, there are no quantitative estimates regarding this mortality.

5. EASTERN SOUTH PACIFIC

In Chile and Peru, artisanal fishermen often request fishery agencies for a systematic reduction of sea lion numbers with the aim to reduce fishery interactions. Direct illegal hunting of *O. flavescens* in the main breeding rookeries and haul-out sites by using guns, explosives and other weapons disturbs the structure of colonies and causes increased mortality. Apparently in Peru, adult males are the main target of this hunting because of the use of genital organs as aphrodisiacs.

Operational interactions between *P. macrocephalus* and the Patagonian toothfish artisanal fleet are much like those outlined in Region 4. Biological interactions (e.g. competition) between fisheries and marine mammals at the population level are suspected, particularly between *P. macrocephalus* and the large scale jumbo squid (*Dosidicus gigas*) fishery or the sea lion and fur seal populations and the anchovy fishery off Peru. However, due to the complexity of the ecological linkages involved and the low research effort developed until present, the nature and implications of such relationships still remain obscure.



AQUATIC MAMMALS IN LATIN AMERICA: Defining high-priority conservation needs and actions

Arguably the main problem faced by small cetaceans in the northern range of this region (northern Chile, Peru and Ecuador) is centred on five species of small cetaceans: *L. obscurus*, *Delphinus capensis* (Long-beaked common dolphin), *D. delphis*, *P. spinipinnis* and *T. truncatus*. Despite the fact that national conservation measures ban the capture and commercialization of small cetaceans and their meat, catches still occur including clandestine harpooning in northern Chile and most notably in Peru. National legislation conferring full protection to small cetaceans appears to have hardly influenced incidental captures, predictably so, as long no adjustments in fishing techniques have been established for mitigation of net entanglements. Total fisheries-related mortality of small cetaceans in Peru was estimated at 10,000 individuals in 1985, before a ban was established. However, despite the ban, in 1994, combined by-catch and directed catch mortality soared to an estimated 17,500 individuals, the highest ever recorded in South America. The obvious unsustainability of this exploitation called the attention of the public opinion and the press, and an intensive campaign for the conservation of this species was a success. However, the success of the public campaign and legislation have inspired wariness among fishermen to openly report small cetacean bycatch even if accidentally entangled, encouraging covert landings and the development of a domestic black market in cetacean meat. Presently it is difficult to obtain information from fishermen and even more difficult to sample carcasses, making almost impossible to obtain accurate mortality figures. In Ecuador, tuna trawlers have been recently reported to catch hundreds of *T. truncatus* in a single operation. Obviously this issue is still a matter of concern, particularly among the species that remain associated with tuna.

All these problems, coupled with deficient enforcement of legal conservation measures (including ecotourism), limited environmental awareness by local inhabitants and habitat reduction and pollution derived from increased urbanization of coastal areas, multinational naval exercises and oil spills, possibly add unsustainable pressures to aquatic mammals inhabiting the region. When considering that large scale environmental phenomena such as El Niño Southern Oscillation (ENSO) events impact strongly in the region by inducing the decrease of some populations by even 60% (in the case of pinnipeds), uncertainty and a presumably adverse future for these species is envisaged.

6. EASTERN TROPICAL PACIFIC

The main human-caused mortalities of cetaceans in this region are related to fisheries, especially coastal ("inshore") fisheries. There are records of more than 125 specimens recovered from artisanal fisheries, and killed by gillnet entanglement, or even deliberately by harpoons or firearms. The most frequently involved cetaceans are the *D. delphis*, *D. capensis*, *T. truncatus*, *Stenella*



AQUATIC MAMMALS IN LATIN AMERICA: Defining high-priority conservation needs and actions

attenuata (panropical spotted dolphin), and *Phocoena sinus* (vaquita). Dolphins killed are frequently used as shark bait. Large cetaceans have also been affected by fisheries. At least seven cases of *Eschrichtius robustus* (gray whale) entanglements in gillnets have been documented in the Gulf of California, with five of these whales being released. In the last two years two *Megaptera novaeangliae* (humpback whales) and five *P. macrocephalus* became entangled in gillnets in the Gulf of California.

Another apparently human-caused mortality event occurred in the winter of 1995 in the upper Gulf of California where 367 dolphins (including *D. delphis*, *T. truncatus*, and *Stenella coeruleoalba* (striped dolphin)), 8 baleen whales (including *Balaenoptera physalus* (fin whale), *B. acutorostrata* (common minke whale), and *B. edeni* (Bryde's whales)), 51 *Zalophus californianus* (California sea lions), and 215 sea birds (mostly Pacific loons, eared grebes, brown pelicans, and double-crested cormorants) were found dead, possibly due to sea contamination by NK-19, a fluorescent cyanide compound used by narcotraffickers to mark drop-areas for unloading drugs. Although discounting that specific agent as the proximal cause of mortality, the die-off was likely caused by an unknown toxic substance in the water or in prey ingested by the affected animals.

In addition, habitat degradation from seismic prospecting and chemical compounds most possibly affect ziphiids, *P. macrocephalus* and kogiids throughout the area. Urban coastal development associated with tourism possibly affects *P. sinus* and large baleen whales such as *B. musculus*, *B. physalus*, *E. robustus* and *M. novaeangliae*.

AGENDA ITEMS 6 & 7. DISCUSSION AND PRIORITISATION OF NEEDED ACTIONS

CONTINENTAL ROUNDUP

The problems faced by marine and freshwater aquatic mammals in Latin America include incidental mortality in fisheries, direct exploitation for human consumption or use as bait, habitat degradation and loss for agricultural use in the case of the Amazon or for development (inc. aquaculture) and recreational use in coastal areas, and competition with humans for marine and freshwater resources. A further problem is that there is a generalized lack of basic information about aquatic mammal conservation issues and local inhabitants are not aware of the ecological value and role of marine mammals or other organisms in marine and freshwater ecosystems and the threats they currently face.



AQUATIC MAMMALS IN LATIN AMERICA: Defining high-priority conservation needs and actions

For most aquatic mammals in Latin America, there is little or no quantitative information on abundance and trends. Few exceptions include *M. leonina* in northern Patagonia (Argentina) and *Otaria* in Chile and northern Patagonia (Argentina), *Eubalaena australis* (southern right whale) and some few species of small cetaceans, like *L. obscurus* and *C. commersonii* in Patagonia and southern Chile, *P. blainvillei* in southern Brazil, and river dolphins in parts of Amazonia (*S. fluviatilis* and *I. geoffrensis*). In addition we have little information on regard to population boundaries and stock identity.

Incidental mortality in all type of fisheries seems to be the most important source of mortality for aquatic mammals at all latitudes. The most critical situations are probably those involving *P. sinus* and *P. blainvillei*. Other species or local stocks that are taken in unknown but potentially unsustainable rates include the *S. fluviatilis* (coastal marine tucuxis) in parts of the Brazilian coast, *L. obscurus* in Peru and Patagonia, *D. delphis* and *D. capensis* and *P. spinipinnis* in Peru, and *L. australis*, *C. commersonii* and *C. eutropia* in southern South Atlantic and Pacific Oceans. In most instances, the problem of aquatic mammal bycatch has not been addressed by fishery authorities as part of fishery management policies. In addition to incidental mortality, direct exploitation of small cetaceans is likely to occur in Peru, Ecuador and northern Chile. The direct take was derived from incidental catch only a few decades ago, situation which should be placed in the context of poverty and marginal social conditions of part of the human population in the region. Cetaceans are taken to be used for human food, oil and bait. Even though the direct take is forbidden by law in all countries, there is no control or monitoring of the current situation.

With regard to large whales, documented incidental mortality in fishing gear has been reported to occur sporadically on some occasions for *P. macrocephalus* off Chile, Peru and Ecuador and for *M. novaeangliae* in Ecuador. Artisanal fishermen confuse baleen whales for *P. macrocephalus* and are thus vulnerable to their retaliatory actions which include shooting, ramming or using explosives.

Among the pinnipeds, *O. flavescens* and other otariids as well, are blamed by fishermen for depleting target species in most of its distributional range, destroying the fishing gear and damaging caught and marine farm-grown fish. Even though *O. flavescens* rookeries are a tourist attraction at least in Argentinean Patagonia, individuals are shot by fishermen off southern Brazil, killed in unknown numbers in aquaculture farms and in artisanal fishing operations in southern Chile and are also a culling target in Peru. In contrast, at the moment, cetaceans are generally not blamed for depleting target species of marine fisheries, but *P. macrocephalus* and *O. orca* are blamed for damaging the gear and the catch in the Patagonian toothfish demersal longline fishery off Chile, and Brazilian and Uruguayan tuna and swordfish pelagic longlining. The ecological impacts of



AQUATIC MAMMALS IN LATIN AMERICA: Defining high-priority conservation needs and actions

fisheries are particularly important in the South-eastern Pacific and South-western Atlantic where large fleets of trawlers, jiggers and long liners have been operating over the last two decades. Their possible role in reducing prey abundance for aquatic mammal populations has been poorly documented and most probably underestimated.

From the ecosystem point of view, the effects of deforestation for agricultural and land use is the most important problem for the aquatic mammal species in the Amazon and Orinoco basins. *Inia geoffrensis* is caught incidentally and sometimes poisoned by fishermen with folidol. In addition, dam construction (hydroelectric plants), pollution, incidental and direct catch and the lack of environmental awareness in local human populations complicates the situation of aquatic mammals, isolating stocks and reducing populations, particularly for *T. manatus*, *T. inunguis*, *P. brasiliensis* and *L. longicaudis*.

Habitat loss and degradation is also perceived as an important threat in coastal tropical Atlantic and in the Pacific where the mangrove ecosystem is replaced by urbanization and development. Some species seem to be critically dependent on the mangrove ecosystem like the marine *S. fluviatilis* and *T. manatus*.

In spite of the fact that aquatic mammals inhabiting the region are protected by national laws, regulations seem to be far from achieving species conservation in practice. With few exceptions, bycatch is largely not monitored nor considered part of the fishery management. The Pacific and the Amazon countries have signed political treaties which include ecosystem or species conservation; however, shared management has not been incorporated as a conservation strategy or priority.



AQUATIC MAMMALS IN LATIN AMERICA: Defining high-priority conservation needs and actions

REGION-WIDE CONSERVATION STRATEGY

Recognizing that no single strategy will facilitate the recovery of vulnerable or endangered populations, reverse trends of population decline or habitat deterioration (Reeves *et al.* 2003) we have developed a multifaceted and comprehensive strategy for the conservation of aquatic mammals in Latin America. The strategy includes elements such as research, management, political action, education, capacity-building and ability to address long-term financial needs. The strategy is organized as a multi-element diagram (Fig. 1) and each panel includes a set of proposed actions taking into consideration the context of interrelations between elements.



Figure 1: Elements identified as tactical for implementing an aquatic mammal conservation strategy in Latin America.



AQUATIC MAMMALS IN LATIN AMERICA: Defining high-priority conservation needs and actions

MANAGEMENT

- **Management policies** arising from results obtained through scientific research should be promoted for rapid implementation at national and local levels. The strengthening of linkages between research groups and NGOs at the national and regional level should assist in this task.
- Build up mechanisms and activities to foster **joint efforts** between NGOs, universities, the local community and governmental agencies for implementing conservation plans for aquatic mammals (e.g. monitoring, mitigation, enforcement, environmental education, etc.).
- Initiatives between relevant management agencies should be encouraged in order to establish **tangible agreements** for managing river basins and coastal areas, among others.
- Generate **specific legal mechanisms** which promote aquatic mammal conservation, and in countries where this has been previously done, work towards their effective implementation and enforcement. In addition, divulge these legal issues among local communities.
- **Integrate information** generated by scientific monitoring programs and modify or promote adequate management measures.
- **Enforce existing fishery regulations** and consider additional regulations. Some fish stocks have declined because of inadequate policing; for example, extensive trawling close to shore has had a high impact on benthic fauna and on juveniles of target fish species. One regulatory approach might be to impose limits on the allowable length of gillnets. For example, in Rio Grande do Sul, southern Brazil, the coastal gillnet fleet (about 175 boats) uses nets with an average length of about 7 km (some boats use nets more than 10 km long). Lowering the allowable net length could bring benefits to both, aquatic mammals and fish stocks.
- **Modify fishing gear and practices**, e.g., by forcing changes in fishing areas, reducing the total fishing effort, imposing spatial and/or temporal fishing closures, or introducing alternative fishing methods. Such modifications may be implemented not only to reduce aquatic mammal mortality, but also to conserve economically valuable fish stocks that are depleted or rapidly declining. Government agencies, the fishing industry, fishery and marine mammal biologists, and representatives of local fishing communities will need to work together to design and promote appropriate conservation measures in particular areas.
- **Include aspects of incidental catch of aquatic mammals into management policies** of conflictive fisheries by evaluating its impact on populations and implementing mitigation measures.



AQUATIC MAMMALS IN LATIN AMERICA: Defining high-priority conservation needs and actions

- Design **management plans for certain fisheries using multispecific models** which include aquatic mammals and other top predators in its formulation.
- Encourage the **inclusion of marine mammals in fishery management policies** and promote the implementation of mitigation measures to reduce directed and incidental mortality, while also enhancing the enforcement of existing legislation.

POLITICAL ACTION

- **International agendas** such as the Permanent Commission for the South Pacific (CPPS), Amazon Cooperation Treaty (TCA), United Nations Environmental Program (UNEP) Coastal Areas, Kyoto Agenda, Convention on Biological Diversity (CBD), Convention for the Conservation of Migratory Species of Wild Animals (CMS) and Convention on Wetlands (RAMSAR) should be effectively adopted by all countries in the region. In particular, the adherence of those countries not yet part of CMS or RAMSAR should be promoted. With regard to the involvement of Latin American countries in the International Whaling Commission (IWC), the participation of delegations should be regularized and further supported with scientific advisors.
- **Implement national committees** for effectively applying these instruments through the study of respective national priority-based strategies.
- Encourage long term **cooperative studies and actions** (e.g. monitoring programs) between countries.
- Endorse **joint conservation strategies** on international borders.

EDUCATION

- Promote the inclusion of aquatic mammal conservation topics (and marine and freshwater ecosystem threats in general) into formal **educational curricula** at different levels and encourage formal and informal **public outreach** activities with focal groups (children, fishermen, tour operators).
- At a regional level, TV, newspaper and radio coverage is fundamental to **reach a wider audience** on the problems that affect aquatic mammals and the efforts devoted and the resources needed to solve them.
- Foster **education and environmental awareness programs** for the local community while reinvigorating **traditional cultural knowledge**.



AQUATIC MAMMALS IN LATIN AMERICA: Defining high-priority conservation needs and actions

- Motivate **sustainable economic activities** within local communities that promote the conservation of aquatic mammals, such as ecotourism (only with suitable species and under strict monitoring). Also, involve locals in scientific research programs.
- **Establish or strengthen the capacity** of rehabilitation centres according to standardized protocols and implement within these a strategic educational program.

FINANCING MECHANISMS

- Investigate mechanisms that allow the **optimal use of available funds** through joint efforts between international institutions, universities, research centers, NGOs and governmental agencies on specific priorities already identified, discussed and approved by international bodies such as IWC, IUCN, UNEP, CMS as well as those emanating from national action plans.
- **Unconventional funding mechanisms** should be pursued in order to allow the implementation of research programs and conservation actions at the regional level, between countries that share common problems at a specific or ecosystemic level. The mechanisms to explore should include the development and/or strengthening of an effective communication strategy with local and international companies (under the premises of social responsibility and tax deductibility) to forge partnerships that provide seed funds to start securing longer-term financial needs. This could also solve the problem of forming high-standard research groups and ensuring continuation and stability to consolidated research teams.

CAPACITY-BUILDING

- There is a need to **standardize methodologies among Latin American researchers**. In this sense, workshops and courses that target active researchers and resource managers should be developed with the objective of providing the necessary methodological and analytical tools for evaluating and managing biological populations and ecological communities (e.g. abundance estimation, spatial dynamics, identification of management stocks, quantification methods in fishing activities, etc.).
- Enhance instruments of **joint collaborative work** among researchers in the region through exchange of biological material, database implementation and short or medium term visits.
- Implement a **system of scientific observation** on board fishing fleets known to interact with aquatic mammals and on whale watching and ecotourism activities, while providing training to operators involved in these enterprises.



AQUATIC MAMMALS IN LATIN AMERICA: Defining high-priority conservation needs and actions

- **Build capacities within management agencies** and foreign affairs officials on regard to current aquatic mammal conservation issues.

RESEARCH

- Identify aquatic mammal **occurrence, abundance and status**, with particular reference to migratory routes and patterns. The establishment of selected long-term monitoring programs would be essential.
- Identify population **stocks or evolutionary significant units (ESUs)** of aquatic mammals in the different regions.
- Promote the development of **interdisciplinary research programs** that aim at reaching integral solutions to problems that affect aquatic ecosystems.
- **Evaluate potential risks** most likely to affect aquatic mammals in relation to habitat degradation, bioaccumulation of pollutants and other anthropogenic factors that result in conservation threats to marine and freshwater ecosystems.
- Investigate the **effects of underwater sound emissions** from diverse sources (e.g. seismic prospecting), particularly during the critical period of baleen whale migration.
- **Collect biological samples** from by-caught animals for investigations of stock identity and life history. Ideally, this should involve coordinated efforts of various individuals and groups working along different portions of the coast using standard methods.
- Conduct tests with **acoustic deterrents** (“pingers”) which have the potential to contribute to bycatch mitigation, since it is essential that their effectiveness be demonstrated through controlled scientific experimentation before their widespread use in fisheries is authorized, and that such use is monitored to confirm continuing effectiveness and to detect unforeseen consequences. This would apply equally to other gear modifications and alternative fishing methods.
- Identify **conservation hotspots** (such as breeding, nursing or feeding areas for aquatic mammals) to promote the creation of Marine Protected Areas (MPAs).
- Evaluate the effects of anthropogenic **medium to large scale perturbations** (e.g. oil spills) on the performance of readily accessible species such as otariids, coastal dolphins, and possibly, large whales. This should also take into consideration the possible coupled impact of co-occurring natural phenomena such as El Niño Southern Oscillation events.



AQUATIC MAMMALS IN LATIN AMERICA: Defining high-priority conservation needs and actions

REGIONAL PRIORITISATION OF NEEDED ACTIONS

1. CARIBBEAN

- Develop educational programs for riverside and coastal communities that share their habitat with *S. fluviatilis*, *T. manatus* and *T. inunguis* and raise public awareness on the threats that these species face.
- Promote best practices for sustainable management and strictly protect mangrove and marsh ecosystems to guarantee habitats and food availability for *S. fluviatilis*, *T. manatus* and *T. inunguis*.

2. WESTERN TROPICAL ATLANTIC

- Carry out a workshop on South American river dolphins (*I. geoffrensis* and *S. fluviatilis*) to assess their current conservation status and define priorities for research and conservation.
- Generate conservation and protection measures on breeding, nursing and feeding areas for *T. manatus* and *T. inunguis*.
- Undertake abundance estimation of river dolphins for the main river basins in South America (Amazon and Orinoco).
- Evaluate negative interactions between river dolphins (*I. geoffrensis* and *S. fluviatilis*) and fisheries.
- Develop a research program to evaluate the status of *L. longicaudis* in South America.
- Evaluate distribution and abundance of *P. brasiliensis*, *T. manatus* and *T. inunguis* in the Amazon and Orinoco basins.

3. WESTERN SOUTH ATLANTIC

- Design and develop medium and long term studies to assess the **impact of ecotourism** on behaviour and habitat use patterns, particularly on species such as: *S. fluviatilis*, *M. novaeangliae*, *E. australis* and *O. flavescens*.
- Carry out workshops to develop a **conservation strategy for *S. fluviatilis*** as has been done with *P. blainvillei*. The main goals of the workshop would be to: (a) identify conservation problems and research needs, (b) review the status of national and international legislation and of multi-lateral and bi-lateral agreements, (c) set priorities for conservation-related research and conservation actions, (d) where appropriate and feasible, establish networks for sharing data and specimens and for facilitating collaborative work, and (e) improve communications among



AQUATIC MAMMALS IN LATIN AMERICA: Defining high-priority conservation needs and actions

the many researchers, conservation groups, and management authorities. Fisheries representatives, as well as decision-makers and representatives of management bodies, should be encouraged to participate in the meetings as much as possible.

- Build public awareness on the risks that gillnet fishing poses to *P. blainvillei*, and of the ways in which the conservation of this species might be related to that of marine resource conservation more generally, including valuable teleost and elasmobranch stocks. Education programs in schools are one obvious mechanism, but broader efforts to publicize *P. blainvillei*'s existence, as well as its vulnerability to bycatch, may be appropriate.
- Undertake abundance surveys and stock identification investigations on particularly vulnerable population of coastal dolphins (e.g. *S. fluviatilis*, *P. blainvillei*, *T. truncatus*) and otariids.
- Continue conducting tests with acoustic deterrents ("pingers").

4. SOUTHERN SOUTH AMERICA

- Further describe and quantify the **impacts of industrial fisheries** with particular reference to sperm whales and killer whales, in both the South Atlantic and Pacific through the development of an **on-board observer program** in industrial fisheries with potential impact on marine mammals (bottom trawl fishery for hake and shrimp in the Southern South Atlantic, longline fishery for Patagonian toothfish in South Atlantic and Pacific).
- Develop **multispecific models** and incorporate marine mammals as top predators in fisheries management, with special reference to evaluating the effects of high extraction levels on ecosystems (hake and squid fisheries).
- Carry out research projects to investigate the impact **of artisanal fisheries on coastal dolphin species** like *L. australis* and *C. eutropia*, with the main goals of: (a) estimating abundance on a co-operative-based effort between Chile and Argentina, (b) identifying population stocks for management unit definition, and (c) evaluating the impacts of fisheries and aquaculture activities.
- Carry out **research projects on otter populations** with the main goals of (a) estimating abundance of *L. provocax* and *L. felina*, (b) identifying population stocks for management units definition, and (c) evaluating the impact of human activities and the effects of introduced species (e.g. beaver, mink, musk-rat).
- Develop research projects to evaluate the **conservation status of sea lion populations** with the main goals of (a) evaluating the status and population trends of *O. flavescens* and *Arctocephalus* spp. through their distributional range along the Argentinean and Chilean coasts (b) identifying population stocks for management unit definition, and (c) evaluating the impacts of fisheries and aquaculture activities.



AQUATIC MAMMALS IN LATIN AMERICA: Defining high-priority conservation needs and actions

5. EASTERN SOUTH PACIFIC

- Describe and quantify the degree of **interaction between artisanal and industrial fisheries** particularly (but not exclusively) with sperm whales and killer whales, through the development of an **on-board observer program** (Patagonian toothfish, tuna and albacore fisheries).
- **Quantify** illegal captures of dolphins, otariids and otters inhabiting the region by implementing an *ad honorem* network for reporting these occurrences and enforce national regulations.

6. EASTERN TROPICAL PACIFIC

- Implement a regional program to monitor human activities involving the generation of **potentially harmful sounds** to marine mammals and determine the extent and potential impact of these activities. This project would require (a) the establishment of local (by country) and regional georeferenced databases containing detailed information on location, duration, and intensity of sounds generated by seismic platforms involved in oil prospecting or geophysical research, as well as by naval operations and joint exercises, (b) the monitoring of the response of marine mammals to these activities, by collecting and analyzing sighting and behavioral data before, during, and after they have taken place, and (c) the prompt and proper collection of marine mammal carcasses that may be found coincident to these activities, to ascertain the ethiology of marine mammal mortality induced by loud sounds.
- Investigate the **effects of seismic prospecting** on marine mammals with particular attention to the members of the families Ziphiidae, Physeteridae and Kogiidae.
- Assess the **impact of fisheries** on aquatic mammal populations with particular emphasis on *Phocoena sinus* and *Zalophus californianus*; and work towards the implementation of their proposed recovery plans.
- Follow up on the implementation of the management and **conservation plan for the Gulf of California**.
- Determine the **effects of whale-watching and ecotourism activities**, particularly on large whale species such as *E. robustus*, *M. novaeangliae* and *B. musculus* and *B. physalus*.



AQUATIC MAMMALS IN LATIN AMERICA: Defining high-priority conservation needs and actions

PROPOSED CONCERTED ACTIONS

REGIONAL CONCERTED ACTIONS

Region 1

All countries:

- Develop a Memorandum of Understanding (MOU) for the conservation of Atlantic manatees and coastal dolphins within the framework of the CMS and signed by coastal Atlantic countries. This should allow the implementation of coordinated monitoring program that allows the detection of mangrove coverage loss and other processes that affect marine ecosystems. This initiative could be supported through UNEP's Regional Program for the Caribbean and should include the assessment of distribution and abundance of the species inhabiting the region.

Region 2

Brazil, Venezuela, Colombia, Ecuador, Peru and Bolivia:

- Develop a MOU for the conservation of manatees, river dolphins, otters and coastal dolphins by countries adhering to the Amazonian Treaty countries and within the framework of the CMS. This memorandum should take the form of a cooperative program between countries inhabited by *I. geoffrensis*, *T. inunguis*, *T. manatus*, *P. brasiliensis* and *L. longicaudis* to guarantee the successful implementation of conservation strategies that span between the enforcement of existing laws to the reduction or mitigation of anthropogenic activities that affect these species in particular or the aquatic ecosystems in general. The Amazon Cooperation Treaty might correspond to the most adequate body through which this initiative could be developed.

Region 3

Brazil, Uruguay and Argentina:

- Develop a trilateral MOU designed for the conservation of *P. blainvillei*. The species is migratory, as defined by the CMS, and its habitat is influenced by factors extending beyond



AQUATIC MAMMALS IN LATIN AMERICA: Defining high-priority conservation needs and actions

the jurisdictions of more than one state (e.g. river runoff). The concept of shared responsibility for *P. blainvillei*'s conservation among the three range states is viewed as a priority.

Region 4

Argentina and Chile:

- Promote bi-national MOUs between Argentina and Chile for the conservation of species listed in Appendix 1 and 2. This agreement should focus on abundance estimation, stock determination and on the impacts derived from fishery and aquaculture activities on whales, coastal dolphins, otariids and otters. In addition, a focal point with the necessary resources for the coordination of these agreements should be designated and implemented, alternatively, the LAMAMA (office of the Cetacean Specialist Group (CSG) for Latin America) or the Universidad Austral de Chile (office of the CMS for the Neotropics). Further, the development of a common Integrated Coastal Zone Management Plan should be discussed and promoted.

Region 5

Chile, Perú, Ecuador and Colombia:

- Enforce the conservation of cetaceans, pinnipeds and otters possibly within the Permanent Commission for the South Pacific (CPPS) and through a MOU coordinated by the CMS that mainly focuses on large whale population structure, migratory pathways, destinations, interactions with fisheries and also on regard to threats for otariid and coastal dolphin conservation.

Region 6

Ecuador, Colombia, Central America and Mexico:

- Develop a MOU for determining large whale stocks, abundance and interactions with fisheries / tourism, together with the assessment of problems faced along their migratory routes.



AQUATIC MAMMALS IN LATIN AMERICA: Defining high-priority conservation needs and actions

MULTI-REGIONAL CONCERTED ACTIONS

Regions 4, 5 and 6

Chile, Peru, Ecuador, Colombia, Central America and Mexico:

- Investigate large whale ecology with emphasis on migratory pathways, stock identity and interactions with fisheries along the Eastern Pacific coast.
- Organize a multi-regional training course in techniques for the estimation of aquatic mammal abundance and spatial modeling, taught at regular intervals (2-4 years), and encourage the participation of students. Because the need for such training is of broad interest to scientists and conservation agencies throughout the region, the course could be sponsored by SOLAMAC, and taught coincidental to the development of the Conference of the Latin American Society of Aquatic Mammal Specialists (SOLAMAC). These courses should consider inviting management officers from different countries to encourage governmental participation.
- Organize a multi-regional training course in techniques for dealing with marine mammal strandings and the biological sampling of specimens caught in fishery operations, taught at regular intervals (2-4 years), and encouraging the participation of students. Because the need for such training is of broad interest to scientists and conservation agencies throughout the region, the course could be sponsored by SOLAMAC, and taught around the time of its bi-annual conferences. These courses should consider inviting management officers from different countries to encourage governmental participation.



**AQUATIC MAMMALS IN LATIN AMERICA:
Defining high-priority conservation needs and actions**

AGENDA ITEM 8. OTHER BUSINESS & CLOSE OF THE WORKSHOP

A further 11 species were recommended to be considered for inclusion in CMS Appendices in order to be eligible for conservation initiatives (Table 2). While respective countries work towards this, it was recognized that although not all Latin American species are currently included in the CMS Appendices, most of the included ones could serve as umbrella species to try and address a specific problem affecting one or more species.

Table 1: Species list and regional occurrence of species proposed for inclusion on CMS Appendices.

SPECIES	SUB-REGIONS
Delphinidae	
<i>Sotalia fluviatilis</i>	1-2-3
<i>Tursiops truncatus</i>	1-2-3-4-5-6
Otariidae	
<i>Arctocephalus gazella</i>	3?-4-5?
<i>Arctocephalus galapagoensis</i>	5-6
<i>Arctocephalus philippi</i>	4?-5
<i>Arctocephalus townsendi</i>	5-6
<i>Zalophus wollebaeki</i>	5-6
Phocidae	
<i>Mirounga leonina</i>	3?-4
Mustelidae	
<i>Pteronura brasiliensis</i>	1-2-3
<i>Lontra longicaudis</i>	1-2

The co-chairs of the meeting acknowledged the hard work and participation of so many researchers and students during the duration of the workshop. It was also highlighted that this new procedure of working together with open doors to everyone had been a most enriching experience and had certainly reaffirmed the potential for cooperation we have in Latin America.

After explaining that a draft report of the workshop would be circulated among participants in the near future to search for further comments, and after issuing a call for proposals on high-priority research and conservation actions, the meeting was adjourned.



AQUATIC MAMMALS IN LATIN AMERICA: Defining high-priority conservation needs and actions

APPENDIX A. WORKSHOP AGENDA

DAY 1 (18 October 2002)

MORNING

1. Opening of the Workshop [Schlatter]

- Welcoming remarks to participants and general public; Introduction.

2. Adoption of the Agenda [Crespo]

- Amendments to and adoption of workshop agenda, appointment of rapporteurs, and establishment of *ad hoc* subgroups.

3. Review of the terms of reference [Crespo, Schlatter, Hucke-Gaete]

- Review and update the conservation status of aquatic mammals by country/sub-region and species;
- Identify significant gaps in scientific knowledge and assess the threats that must be met to ensure effective conservation;
- Develop recommendations of high-priority research and conservation actions at the national/sub-regional and/or regional levels;
- Discuss the potential for development of formal regional cooperation by means of memoranda of understanding and/or agreements;
- Presentation of the new IUCN Action Plan for cetaceans and WWF's recent bycatch reduction strategy [Crespo].
- Develop a formal report of the workshop.
- Coffee break.

4. Conservation status of aquatic mammals in Latin America: overview of known or presumed impacts in the Caribbean and South West Atlantic

- General roundtable discussion.



AQUATIC MAMMALS IN LATIN AMERICA: Defining high-priority conservation needs and actions

AFTERNOON

5. Conservation status of aquatic mammals in Latin America: overview of known or presumed impacts in southern South America and the Eastern South Pacific

- Sub-regional debate [all areas].
- Coffee break.
- General discussion.

DAY 2 (19 October 2002)

MORNING

6. Discussion and prioritisation of needed actions

- Review and discussion of selected rapporteur contributions by subregional coordinator [Areas 1-3].

AFTERNOON

7. Discussion and prioritisation of needed actions [Continued]

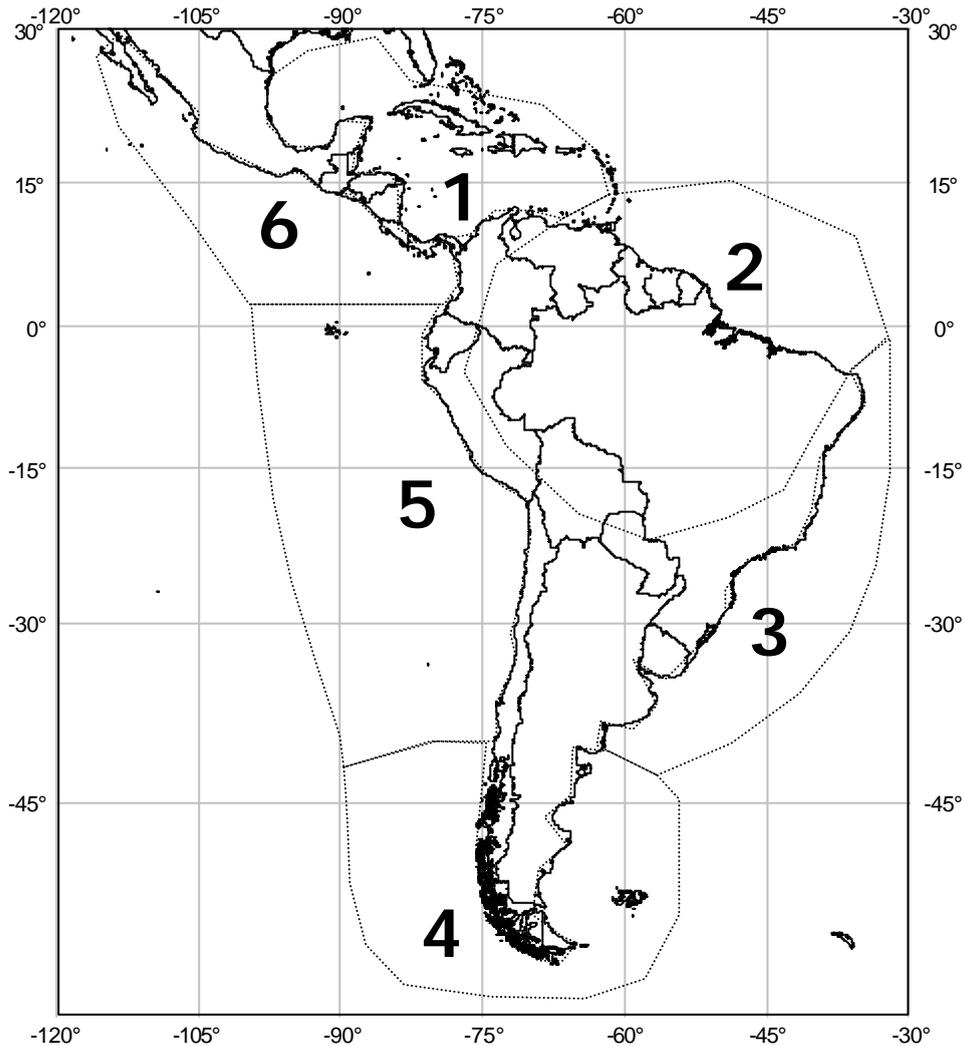
- Review and discussion of selected rapporteur contributions by subregional coordinator [Areas 4-6].
- High-priority conservation actions and suggestion of needed conservation projects and potential concerted actions. Further discussion.
- Coffee break.

8. Other business & close of the workshop.



**AQUATIC MAMMALS IN LATIN AMERICA:
Defining high-priority conservation needs and actions**

APPENDIX B. PROPOSED SUB-REGIONS FOR DISCUSSION OF KNOWN OR PRESUMED CONSERVATION PROBLEMS AFFECTING AQUATIC MAMMALS IN LATIN AMERICA.



Scale: 1:60560286 at Latitude 0°

Legend:

- | | |
|------------------------------|-----------------------------|
| 1. Caribbean | 4. Southern South America |
| 2. Western Tropical Atlantic | 5. Eastern South Pacific |
| 3. Western South Atlantic | 6. Eastern Tropical Pacific |



AQUATIC MAMMALS IN LATIN AMERICA: Defining high-priority conservation needs and actions

APPENDIX C. LIST OF PARTICIPANTS.

Invited participants

Name	Country	e-mail
1 Enrique Crespo	Argentina	kike@cenpat.edu.ar
2 Silvana Dans	Argentina	dans@cenpat.edu.ar
3 Natalie Goodall	Argentina	ngoodall@tierradelfuego.org.ar
4 Mirtha Lewis	Argentina	lewis@cenpat.edu.ar
5 Salvatore Siciliano	Brazil	sal@infolink.com.br
6 Eduardo Secchi	Brazil	edu.secchi@xtra.co.nz
7 Mario Rollo	Brazil	kujirabr@yahoo.com.br
8 Sascha Hooker	Canada	s.hooker@st-andrews.ac.uk
9 Luke Rendell	Canada	lrendell@is2.dal.ca
10 Anelio Aguayo	Chile	aaguayo@inach.cl
11 Rodrigo Hucke-Gaete	Chile	rhuckeg@telsur.cl
12 Anne Katrien Lescrauwaet	Chile	ankatles@yahoo.com
13 Gonzalo Medina	Chile	gmedina@uach.cl
14 Roberto Schlatter	Chile	rschlatt@uach.cl
15 Walter Sielfeld	Chile	walter.sielfeld@cavanha.cec.unap.cl
16 Daniel Palacios	Colombia	dpalacios@pfeq.noaa.gov
17 Fernando Trujillo	Colombia	fernando@omacha.org
18 Cristina Castro	Ecuador	pccastro@interactive.net.ec
19 Jorge Urbán	Mexico	jurban@uabcs.mx
20 Ignacio García-Godos	Peru	ag_godos@yahoo.com
21 María Laura Lázaro	Uruguay	marila@fcien.edu.uy
22 Diana Szteren	Uruguay	diana@fcien.edu.uy
23 Robin Baird	U.S.A.	robin.baird@noaa.gov

Partial list of participants that attended and participated of the CMS Workshop

Name	e-mail
1 André Barreto	abarreto@ctmar.univali.br
2 Andrea Martins Cantanhede	manatee@inpa.gov.br
3 Angela Melo	chotiporoti@hotmail.com
4 Carla Christie	carlachristie@yahoo.com
5 Carla Ferreira Josef	carlajosef@hotmail.com
6 Carlos Benhur Casper	biosul@fates.tenk.br
7 Carlos González	Alluet6@hotmail.com
8 Carola Valencia	cholitaz@latinmail.com
9 Carolina Lippi	carola_lippi@yahoo.com
10 Cecilia Lezama	checha@netgate.com.uy
11 César Jaeger Drehmer	cjaeger@terra.com.br
12 Claudia C.Boy	elrancho.cboy@iname.com
13 Claudia Carvalho do Nascimento	claucn@hotmail.com
14 Cristiane A. Martins	albuquerquecris@yahoo.com.br
15 C. Baracho Gomes	jubart.pf@bol.com.br
16 Daniel Danilewicz	danilewi@terra.com.br
17 Daniela Fiuza	daniellafiuza@hotmail.com

[List of participants] continued...



AQUATIC MAMMALS IN LATIN AMERICA: Defining high-priority conservation needs and actions

[List of participants] continued...

18 Diana Morgades	diamorga@hotmail.com
19 Eduardo González	egna_kurre@hotmail.com
20 Fábian Perez	fhperez@muanbe.gov.ar
21 Fabio Daura-Jorge	daurajorge@hotmail.com
22 Fagner A. Magalhães	
23 Felipe Docmac	fdocmac@hotmail.com
24 Felipe Thomas	pepath87@hotmail.com
25 Fernanda Cid Alda	cidfernanda@latinmail.com
27 Fernanda Rosa Rodrigues	Fernanda_div@hotmail.com.br
28 Fernanda Sartor	fesartor@hotmail.com
29 Fernando Oliveira	ipecpesquisas@uol.com.br
30 Fernando Hardt	efm@netkey.com.br
31 Francisco Bravo	kako.bravo@eudoramail.com
32 Francisco Vididi	fvididi@zipmail.com
33 Galia Ely de Mattos	galia@inpa.gov.br
34 Geovanna Lasso	geova111@hotmail.com
35 Haydée Cunha	haydeecunha@yahoo.com.br
36 Hector Pavés	hpaves@entelchile.net
37 Helen Waldemarin	ecolontras@ecomarapendi.org.br
38 Ignacio Moreno	igmoreno@zaz.com.br
39 Jimena Belgrano	jimenabelgrano@hotmail.com
40 Jorge Acevedo	jacevedo@123mail.cl
41 Jorge Calvimontes	existia@viabcp.com
42 Jorge Oporto	coterra@telsur.cl
43 José Luis Brito	museo_imsa@hotmail.com
44 José Tonello	efm@netkey.com.br
45 Juan Harries	g_harries@yahoo.com
46 Juan Pablo Torres	j.p.t@rocketmail.com
47 Julio Sanzana	juliosanzana@eudoramail.com
48 Kelly Landen	kellanden@aol.com
49 Larissa Heinzemann	larih@terra.com.br
50 Larissa Rosa de Oliveira	lari@ib.usp.br/lari@puhrs.br
51 Layla Osman	laylaosman@uach.cl
52 Lena Valenzuela	lenavalenzuela@uach.cl
53 Leonardo Wedekin	lwedekin@uol.com.br
54 Livia de Almeida Rodrigues	livrodrigues@msn.com
55 Lucas Hassel	luchassel@hotmail.com
56 Manoel Comes Muanis	manoelmuanis@zipmail.com.br
57 Marcelo Flores	marcelo.flores@uv.cl
58 Marcos Rossi-Santos	mrsantos@bol.com.br
59 María José Pérez	mjoperez@yahoo.com
60 María Paz Villalobos	mariapaz_vs@yahoo.com
61 Marjorie Fuentes	marjorie_fuentes@yahoo.es
62 Marta Cremer	mcremer@ilhante.com.br
63 Mateus Barbosa	ocemhb@bol.com.br
64 Mónica Etchegaray	acorema@terra.com.pe
65 Mônica M. Muelbert	mamiferos@furg.br
66 Olívia Blank	oblankh@entelchile.net

[List of participants] continued...



AQUATIC MAMMALS IN LATIN AMERICA: Defining high-priority conservation needs and actions

[List of participants] continued...

67 Patricia Inostroza	acuapatricia@entelchile.net
68 Paula Laporta	colocha@adinet.com.uy
69 Pedro Castillho	lamaqsl@ccb.ufsc.br
70 Renata Bornholdt	gemars@terra.com.br
71 Renato Rodrigues	ipecpesquisas@uol.com.br
72 Renato Schutz	renatoibf@hotmail.com
73 Roberta Mounayer	rurfe@hotmail.com
74 Sandie Salazar	salazar@fcdarwin.org.ec
75 Sandra Cuenca	cuenca@ifxbrasil.com.br
76 Sandra Ribeiro	sandraribeiro@zipmail.com
77 Sara Rodriguez	vientoritmicoblanco@hotmail.com
78 Sérgio Estima	nema@vetorialnet.co.br
79 Shirley P. Souza	shirleypacheco@yahoo.com
80 Tatiana Manzur	cyanea_m@yahoo.com
81 Ursula Choupay	urschorca@hotmail.com
82 Verónica Araos	lodien_ar@hotmail.com
83 Verónica Vallejos	vvallejos@inach.cl



AQUATIC MAMMALS IN LATIN AMERICA: Defining high-priority conservation needs and actions

APPENDIX D. LIST OF BACKGROUND DOCUMENTS

- Castro, C. 2002. The conservation status of cetaceans in Ecuador. Working paper presented during this workshop. 2 pp.
- Clapham, P.J., S.B. Young & R.L. Brownell Jr. 1999. Baleen whales: conservation issues and the status of the most endangered populations. *Mammal. Rev.* 29(1): 35-60.
- Crespo, E.A. 2001. La franciscana, *Pontoporia blainvillei*: hacia el manejo compartido como herramienta de conservación. Working paper presented during the CMS Regional Workshop for Latin America. Lima, Perú, October 29-31. 2 pp.
- Crespo, E.A. 2002. South American Aquatic Mammals. p. 1138-1143. *In: Encyclopedia of Marine Mammals* (W. Perrin, B. Würzig & J.G.M. Thewissen, eds.). 1414 pp.
- Crespo, E.A., S.L. Dans, M.K. Alonso & S.N. Pedraza. [ACCEPTED] Interacciones entre mamíferos marinos y pesquerías en la costa Argentina. *In: El mar Argentino y sus recursos pesqueros*. Vol. V.
- García-Godos, I.A. & K. Van Waerebeek. 2002. The conservation status of cetaceans in Peru. Working paper presented during this workshop. 2 pp.
- García-Godos, I.A. & J.C. Márquez. 2002. The conservation status of pinnipeds and marine otters in Peru. Working paper presented during this workshop. 2 pp.
- Gerber, L.R., D.P. DeMaster & S. Perry. 2000. Measuring success in conservation. *American Scientist* 88: 316-324.
- Hucke-Gaete, R. (ed.) 2000. *Review of the conservation status of small cetaceans in southern South America*. UNEP/CMS Secretariat, Bonn, Germany. 24 pp.
- Notarbartolo di Sciara, G., A. Aguilar, G. Bearzi, A. Birkun & A. Frantzis. 2002. *Overview of known or presumed impacts on the different species of cetaceans in the Mediterranean and Black Seas*. *In: G. Notarbartolo di Sciara (ed.), Cetaceans of the Mediterranean and Black Seas: state of knowledge and conservation strategies. A report to the ACCOBAMS Secretariat*, Monaco, February 2002. Section 17, 4 pp.
- Reeves, R.R., B.D. Smith, E.A. Crespo, G. Notarbartolo di Sciara, and the Cetacean Specialist Group (2003). *Dolphins, Whales, and Porpoises: 2002-2010 Conservation Action Plan for the World's Cetaceans*. IUCN Gland Switzerland.
- Secchi, E.R. (Ed.) (2002) The Biology and Conservation of Franciscana. *The Latin American Journal of Aquatic Mammals*. Vol. 1 (Special issue 1), 192 pp.
- Urbán R., J., L. Rojas-Bracho, M. Guerrero-Ruiz, A. Jaramillo-Legorreta, and L.T. Findley. In press. Cetacean diversity and conservation in the Gulf of California. *In: Biodiversity, Ecosystems, and Conservation in Northern Mexico*. J. E. Cartron, G.Ceballos, and R.S. Felger (eds.). Oxford University Press, New York.



AQUATIC MAMMALS IN LATIN AMERICA: Defining high-priority conservation needs and actions

Ward, N., A. Moscrop & C. Carlson. [MANUSCRIPT IN PREPARATION] The distribution of marine mammals of the wider Caribbean region.

Ward, N. & A. Moscrop. [1999] Marine mammals of the wider Caribbean region: A preliminary review of their conservation status. UNEP(WATER) / CAR WG.22/INF.7WE.

UNEP/CMS Secretariat documents:

CMS Secretariat. 2002. Guide to the Convention on the Conservation of Migratory Species of Wild Animals. Available from: http://www.wcmc.org.uk/cms/pdf/CMS_Guide_Jan02_en.pdf.

UNEP/ CMS/ Inf 7.7. Convencion sobre la Conservación de las Especies Migratorias de Animales Silvestres. Rec. 7.2 Implementation Resolution 6.2 on By-catch; Rec. 7.1 Cooperative actions for Appendix II Species; Res. 7.2 EIA and Migratory Species.

UNEP/ CMS/ res. 7.15.Draft resolution on the Antarctic Minke, Bryde and Pygmy right whales under the Convention on Migratory Species (proposals submitted by Australia).

Apéndice I Lista de Especies añadidas a los Apéndices I y II en la 7a Reunión de la COP, Bonn, Sept. 2002.

UNEP/ CMS/ Inf 7.9. Lista de los nombres comunes de las Especies que figuran en los Apéndices I y II.

CMS / ScC 10 / Inf. 6 / CMS RW-LA / Doc.8. Formato revisado para la presentación de propuestas de pequeños proyectos.

CMS / RW-LA/ Doc. 7. Procedimientos a seguir para la inclusión de Especies en los Apéndices I y II de la CMS.



**AQUATIC MAMMALS IN LATIN AMERICA:
Defining high-priority conservation needs and actions**

**APPENDIX E. LIST OF LATIN AMERICAN AQUATIC MAMMALS INCLUDED
IN CMS APPENDICES***

Appendix I

Balaenoptera musculus
Balaenoptera physalus
Balaenoptera borealis
Megaptera novaeangliae
Eubalaena australis
Physeter macrocephalus
Pontoporia blainvillei
Trichechus manatus (Honduras & Panama)
Lontra provocax
Lontra felina

Appendix II

Balaenoptera physalus
Balaenoptera edeni
Balaenoptera bonaerensis
Caperea marginata
Physeter macrocephalus
Orcinus orca
Delphinus delphis
Stenella attenuata (Eastern Tropical Pacific)
Stenella longirostris (ETP)
Stenella coeruleoalba (ETP)
Lagenorhynchus australis
Lagenorhynchus obscurus
Cephalorhynchus eutropia
Cephalorhynchus commersonii
Pontoporia blainvillei
Inia geoffrensis
Phocoena spinipinnis
Phocoena dioptrica
Trichechus manatus (Honduras & Panama)
Trichechus inunguis
Otaria flavescens
Arctocephalus australis

* List includes amendments to the Appendices arising from recommendations of the Seventh Meeting of the Conference of the Parties (Bonn, 18-24 September 2002).



AQUATIC MAMMALS IN LATIN AMERICA: Defining high-priority conservation needs and actions

Acknowledgements

We would like to extend our thanks to the CMS Secretariat in Bonn, namely Mr. Arnulf Müller-Helmbrecht and Dr. Marco Barbieri, for making this workshop possible.

In addition, the editors and organizers would like to particularly show appreciation to all participants of the 10th Workshop of South American Specialists on Aquatic Mammals and 4th Conference of the Latin American Society of Specialists on Aquatic Mammals (SOLAMAC) for their hard work and participation and for making this experience a unique one. We hope that these kinds of activities become more frequent in the near future to allow the further strengthening of liaisons among Latin American researchers in their pursuit for common conservation goals.