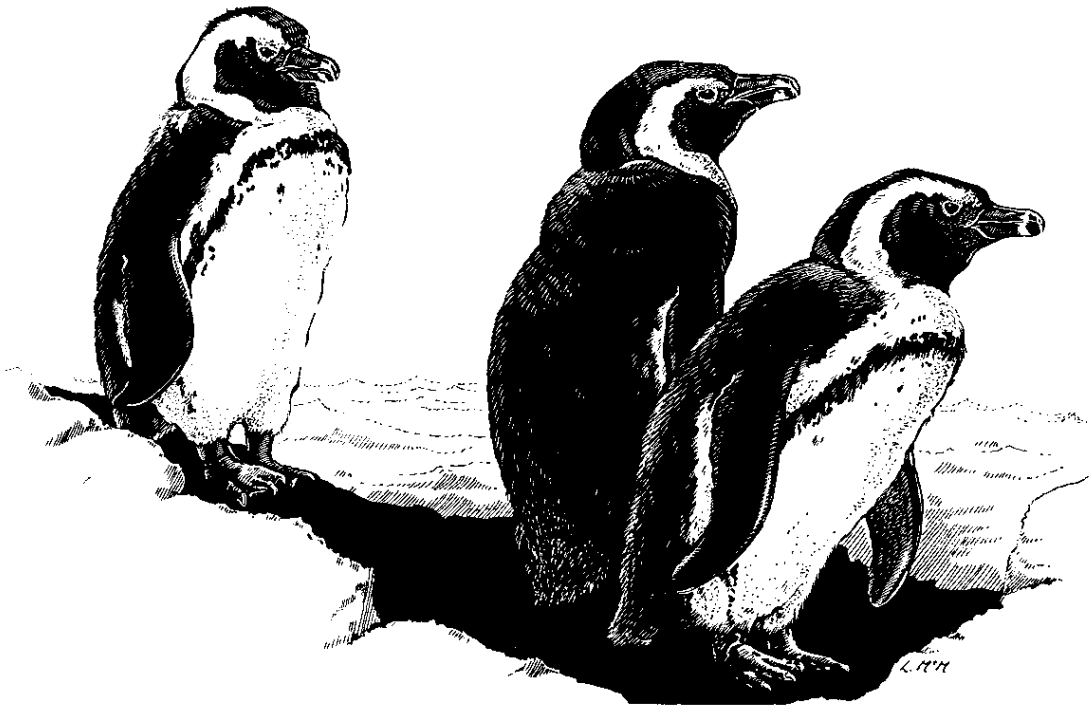
SPHENISCUS PENGUIN CONSERVATION WORKSHOP

9-10 September 2000
Universidad Católica del Norte, Coquimbo, Chile

FINAL REPORT



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July 2002

Speniscus Penguin Conservation Workshop

Universidad Católica del Norte, Coquimbo, Chile
9-10 September 2000
Final Report

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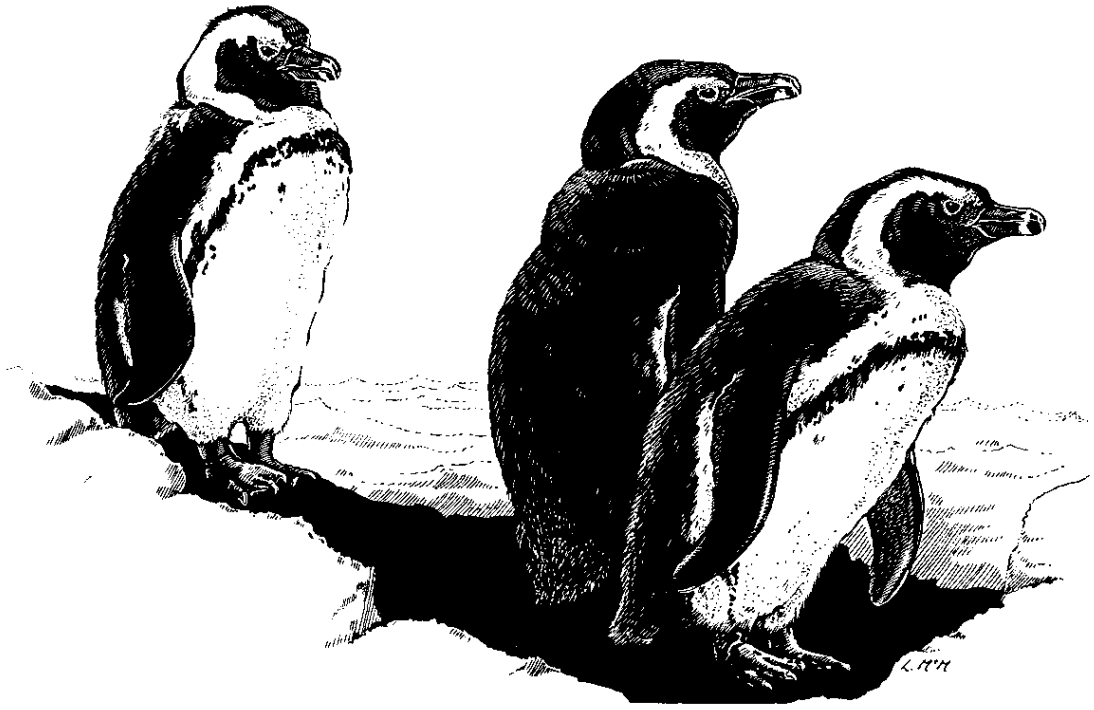

Section 1

Introduction and Summary

SPHENISCUS PENGUIN CONSERVATION WORKSHOP

INTRODUCTION AND SUMMARY

INTRODUCTION

In 1996, just after the Third International Penguin Conference, a Conservation Assessment and Management Plan (CAMP) workshop for Penguins was conducted by the Conservation Breeding Specialist Group of the IUCN Species Survival Commission. This workshop facilitated a substantive review and updating of an earlier Penguin CAMP document, produced in 1992. Thirty-seven people from 10 countries participated in the 2-day event, during which 24 penguin taxa were evaluated on a taxon-by-taxon basis in terms of their current and projected status in the wild. Each taxon was assigned a new IUCN Red List Category of Threat, and priorities were set for conservation action (Ellis et al. 1998)

The results of the workshop were startling and alarming. Of all the penguin species, only those in the Antarctic do not seem to be facing grave, documented declines or other problems that put them at serious risk. Whereas the 1996 IUCN Red List considered only five penguin species to be threatened, penguin biologists at the 1996 workshop considered 11 taxa (9 species) to fall under one of the IUCN Categories of Threat and two as Near Threatened.

As part of the follow-up on recommendations emanating from the CAMP, a Population and Habitat Viability Assessment (PHVA) was conducted for the Humboldt penguin in Chile in October 1998 (Araya et al. 1999), and a PHVA for the African penguin in early 1999 (Whittington et al. 2000). Both species face severe but different threats that put their populations at risk of extinction. Of particular importance, these workshops provided a venue where biologists and other experts were able to share open and honest dialogue as they searched for mutually viable and acceptable strategies for the successful management of the species, with the ultimate aim of developing management plans that would lead to species recovery.

Participants at the two PHVA workshops suggested a fourth penguin workshop, to address the commonalties among all four *Spheniscus* species (Humboldt, African, Galápagos and Magellanic) and to develop a collaborative conservation strategy for the group as a whole. Forty-three people (Appendix I) attended this workshop from 9-10 September 2000 at the Universidad Católica del Norte, in Coquimbo, Chile, following the Fourth International Penguin Conference. Pairing these two meetings allowed participation from a wide range of penguin biologists from all over the world, with

particularly good representation from those biologists working with the three *Spheniscus* species found in South America.

WORKSHOP OBJECTIVES

The two PHVA workshops were an excellent start in developing conservation action plans for the *Spheniscus* group. The present workshop allowed expansion of those plans, involvement of a wider body of expertise in terms of input, and facilitated discussion of specific problems that affect the other two species (Galápagos and Magellanic). Because of the similarities in habitat niches of these four species, they share unique problems, especially with respect to nesting habitat problems and needs.

The objectives of the present workshop were to:
1) review the status of implementation of recommendations from the two PHVAs;
2) determine whether recommendations from the PHVAs are still priorities, and if not, to set new priorities;
3) identify and address the common and different problems and issues affecting the four *Spheniscus* species;
4) discuss among local biologists the priorities for research and management activities for all four *Spheniscus* species.

THE WORKSHOP PROCESS

The workshop began with each participant introducing her/himself and identifying his/her desired outcome for the workshop (Table 1). After a brief discussion, participants worked in three small groups: Humboldt Penguins; African Penguins; and Galápagos /Magellanic Penguins. The two first groups, focusing on species for which PHVAs had been conducted, were asked to review the existing PHVA documents to examine the status of implementation of the recommendations, whether the recommendations from the PHVAs are still priorities, and if not, to set new priorities. The Galápagos /Magellanic group identified the primary problems, themes or issues affecting the conservation of the two species, and identified several actions that could help to improve the problems. Each group then presented their report in plenary and for discussion among the larger group.

Based on the issues discussed the first day both in the working groups and in plenary, the second day's work focused on working in cross-species groups to address issues that affect all four *Spheniscus* species. The working groups were: Monitoring; Fisheries; Protection; and Research.

Reports from the working groups can be found in Section 2 of this document.

Table 1. Desired Outcomes for the Workshop

- Make concrete recommendations and foster "players" to enable them to come true.
- Recommendations to bring international attention to problems with respect to interactions with humans and to reach governments.
- Recommendations to regulate the use of gill nets.
- Legislation.
- Prepare concerted actions through the Bonn Convention on Migratory Species.
- Develop Memorandums of Understanding (MOU) between Chile and Perú for Humboldt penguins and South Africa and Namibia for African penguins.
- Encourage governmental services to be more open to collaboration.
- Recommendations to get Humboldt penguin IUCN Red List category from Vulnerable to Endangered.
- What is the actual population size of Humboldt penguins after the last ENSO?
- Reassess with Chileans and Perúvians the IUCN Red List category of Humboldt penguins based on new data.
- Encourage the Chilean government to include Isla Pájaros I and II and Isla Grande as Protected Areas.
- Determine ways to work with local communities near colonies.
- Avoid interaction with humans at Punta San Juan.
- How to better enforce national laws protecting penguins.
- Investigate development of reserves for Humboldt penguins.
- Identify legislative goals that are or can be supported by research. Get clearer idea of legislation for global issues that affect penguins.
- Develop a structure for the field and zoo communities to continue working together after this workshop.
- Discussion platform for how the group can continue discussions.
- Learn what is going on with penguin populations and communicate it to US audiences.
- Better understand conservation issues with penguins and communicate them at home.
- Learn about conservation, especially with Humboldt penguins.
- Education – spreading the word.
- Encourage the Chileans to join education campaigns to reach more people.
- Better educate people in the Northern Hemisphere about penguin conservation.
- Communicate conservation efforts to the public and other audiences.
- Increase public awareness.
- Learn from others in terms of problems in species conservation.
- Share information and experience with people working with other *Spheniscus* species.
- Observe and steal ideas.

Table 1, continued. Desired Outcomes for the Workshop

- Learn from each other on issues that cross species lines.
- See how scientists work at this meeting and how the process could be applied to other endangered birds.
- Talk among species groups about commonalities – specific recommendations and priorities.
- *Spheniscus* penguins suffer similar problems – carry forth research into our conservation efforts.
- Coordinate approaches to conservation management where species cross borders.
- How can we reduce oil spills, especially in South Africa? What will people do if there is a serious oil spill in another part of the world?
- Increased emphasis on disease in wildlife.
- Increase cooperation among individuals from different regions.
- Use the results from this meeting to help conservation of less charismatic species living in the same environment.
- Develop a better global perspective – establish consensus priorities for international/intra-national cooperation.
- Develop conservation recommendations for Magellanic penguins.
- Develop concrete action steps for the conservation of Humboldt penguins.
- Apply our knowledge to conservation management plans and strategies.
- Review PHVA recommendations – how to prioritize more effectively and see how it relates to funding.
- Review PHVA recommendations and see how to implement and draw up recommendations for the other two species.
- Reach agreement on actions for conservation of penguins.
- Develop one or two achievable recommendations for each species.
- Develop specific, concrete recommendations for research and management, especially for Galápagos penguins.
- Put more effort into the conservation of Galápagos penguins.
- Develop steps to study what is happening when penguins are at sea.
- What is happening at sea and how can we better study this part of the life cycle?
- Determine how the people working with captive animals can collaborate with people in the field and solve problems together.
- Develop ways to make specific project recommendations and coordinate with funders, especially in the zoo community – linking/coordinating needs and funds.
- Continued cooperation among zoos, academics and the field communities.
- How zoos can work with field people on conservation issues, including rehabilitation.
- Use zoos as an interface to communicate ideas.

Summary of Working Group Reports

THE AFRICAN PENGUIN WORKING GROUP

The group identified the following as initiated for **Colony Management**:

- management plan for Dassen Island.
- cat hunting on Robben Island, but not sustained.
- trapping of mammalian predators at Stony Point, but now ceased.
- communication of issues ongoing.
- research being undertaken to look at frequency of avian malaria and other diseases. both in wild and captive populations.
- Robben Island declared World Heritage Site.
- Robben island study set up to quantify impact of tourism.
- Lambert's Bay development of tourism and interpretation program.
- artificial burrows (Lambert's bay/Robben island/Dassen island/Dyer Island).
- rescue/rehab of orphaned chicks.

The following new colony management issues were identified:

- investigate sterilization of feral cats.
- minimize risk of disease transmission.
- control of vehicle traffic on Robben Island.
- request letters from international representatives to Robben Island Museum to highlight the importance of penguins at Robben Island, urging a management plan for the Island.
- entanglement of penguins.
- investigate ways of desensitizing penguins especially at areas of tourism, especially by using models of sleeping penguins to calm them down.

For **Oiling**, the following activities had been initiated:

- developing and testing rehabilitation techniques.
- protocols and video developed to train personnel.
- proposal/request for funding to set up a team to do follow-up work.
- large amounts of public awareness resulted from *Treasure* oil spill in June 2000 near Cape Town, South Africa.
- looking into setting up new rehab centers.

New needs pertaining to oiling were:

- review current legislation and make proposals/lobby for improvement.
- investing in preventive measures.
- lobbying both locally and internationally for more responsible management of oil issues.
- maintain public awareness campaigns and target *Treasure* oil spill (June 2000 near Cape Town, South Africa) volunteers.
- testing different detergents.

- improved facilities to deal with oiling accidents.
- testing techniques for feeding large numbers of birds.
- setting up rehab centers at or near colonies (need for lobbying to achieve this in some areas).
- maintain biological reference database.

Predation
To deal with predation, an assessment of the problem at Dyer Island and Lambert's Bay has been started, but further research is needed.

New issues identified were investigating the possibility of sterilizing seals and electric fences to deter seals (contact Jonathan Banks: banks@lincoln.ac.nz)

Fishery-related Issues
Participants realized that the initial recommendations were over-ambitious. As a matter of urgency, the need to determine food requirements and the predicted escapement of fish required for the penguin population is needed. There also is a need to:
- determine ways to protect food supply.
- reduce potential for incidental mortality by banning gill nets around islands. A proposal to achieve the above (ban on gill nets), has been put forward for areas around Robben and Dassen Islands.

Over-Arching Issues
- need for a memorandum of agreement between South Africa and Namibia
- review of seabird legislation and improvement of enforcement
- lobbying from both local and international sources to put pressure on policy makers, especially regarding development that may have an effect on penguin population.

GALÁPAGOS AND MAGELLANIC PENGUINS WORKING GROUP
'

Issues affecting the conservation of Galápagos and Magellanic Penguins:
1. Climate change
2. Fisheries
3. Oil pollution
4. Tourism
5. Genetic Diversity
6. Exotic species
7. Lack of information
8. Lack of political support
9. Diseases
10. Habitat Loss
11. Financial support

GALÁPAGOS PENGUINS

Fisheries Action Items

1. The Galapagos Islands should become a "true" protected marine reserve where all fisheries are prohibited.
   - Organize a Population and Habitat Viability Assessment Workshop (PHVA)
   - Create a resolution that addresses penguin problems in the Galapagos

2. Prohibit development of any new fisheries and freeze current levels of fishing pressure. Enforce existing laws, including the immigration law, at all levels from national to local.
   - Invite legislators to the PHVA .
   - At the same time, seek changes in fishing regulations to require fishers to place GPS sensors on boats (at peril of loss of license) to monitor compliance with regulations. Regulations must be adopted by the cooperative management council; pressure must be placed on the Junta.
   - Develop funding to implement a new NGO in the Galapagos to put pressure on the Junta.
   - Create a "penguin conservation" Web site, and link with Penguin TAG, Friends of the Galapagos, the Barham's, other Web sites to distribute publicity.

3. Prohibit use of nets in fisheries and freeze expansion of artesanal fisheries into western Galapagos.

Climate Change Action Items:

1. Create better nest sites.
   - Investigate current programs testing artificial nests in Humboldt and African penguins.
   - Seek funding to support nest programs if need is identified.

2. Rehabilitation/supplemental feeding for birds (especially juveniles) that are in the worst shape during severe El Niño/La Niña events.

3. Provide for consistent, annual censuses. Expand monitoring to include body condition during El Niño years.

Small Population Size Action Items:

1. Prevent the introduction of exotic predators on pristine islands; control predators where they currently exist.

2. Monitor wildlife diseases; prevent human-caused transmission of new diseases. Investigate historic genetic diversity for comparison with current. Promote scientific investigation of Galapagos penguins in general.

3. Promote a broad education program.

MAGELLANIC PENGUINS

Fisheries action items

1. Gill net fisheries (artesanal fisheries).
   - Change gear to purse seines, provide incentives to do this. Prevent the use of unattended nets. Encourage NGO's to alert governments to change laws and of the need to provide incentives. Query USA west coast sources and others to see how gill nets were removed from Pacific coastal and other fisheries. Bring together fishermen, legislators and NGO's to decide on how to bring this about.

2. Bycatch from commercial trawlers.
   - Need to quantify bycatch in terms of both quantity and species taken, needs long-term monitoring and research. Need to inform the public of the magnitude of the problem – wasted resources.

3. Introduced species (especially salmonids).
   - Recommend to provincial governments (Argentina) that there be no salmon introductions into the range of Magellanic penguins. If proposals for introductions come forward, produce a "white paper" on ecological concerns surrounding introductions.

4. Overfishing (harvesting down the food web).
   Extend "no-fishing zone" closures past February, into the end of April. Establish new marine protected areas. Recommend that there be no inshore fisheries (within 30 miles of coast) in the Falklands. Restrict industrial fishing from areas of known concentrated penguin use at sea (wintering and foraging areas for fledglings). Argentina and the Falklands should establish an integrated series of marine reserves and zones, subject to adaptive management based on continuing research and monitoring, to benefit all species (fish, seabirds, marine mammals).

Oil Pollution Action Items:

1. Oil transport. End dumping of bilge water.
   We need to discuss how to accomplish this. Survey to determine how important the problem still is.

2. Oil development.
   - Get governments to enforce strict standards for development on new oil fields. Publicity campaigns needed. Need more information on distributions of birds on land and at sea.

3. Lack of prevention / spill response options.

Climate change action items

1. Monitoring/Long-term research
   - Consistent funding is needed to maintain studies

THE HUMBOLDT PENGUIN WORKING GROUP

Because a large number of participants had participated in the Humboldt penguin PHVA, the working group broke into subgroups to discuss the various components of the report.

HABITAT CONSERVATION AND MANAGEMENT

1. Lack of nests with cover

The following have been initiated:

PERÚ: In 1999, two colonies of artificial nests were created in areas previously not used by the penguins. This was done to expand the nesting zones and to increase the availability of covered nests in Punta San Juan. These nests were not used, probably because of the decrease in the breeding population of penguins and the absence of recruits after the 1997-1998 El Niño

CHILE: There was an attempt to increase the native vegetation in Algarrobo with the goal of preventing erosion resulting from rains. This effort was not successful because the gulls took the new plants as nesting material. New efforts, with other kinds of native vegetation will be performed in the following seasons.

New Recommendations and Solutions for the Short-Term

PERÚ

- A proposal has been sent to the Brookfield Zoo to investigate the use of models and recordings of vocalizations of Humboldt penguins in the colonies where there are artificial nests. The goal of this study is to attract other penguins that will use these nests in new areas in Punta San Juan. Based on the results of this study, we will likely recommend that it be repeated in other guano reserves where Humboldt penguins live, such as Punta Coles Isla Pachacamac.

CHILE

- There has been an artificial nest utilization study initiated at Isla Pájaro Niño, Algarrobo, by the Denver Zoo. It will take into account the designs of previous artificial nests used in South Africa and Perú, considering the differences in habitat and climate (frequent rains) in this location.

- At Isla Pájaro Niño, penguins successfully used the hollows constructed with rocks overlaid to join the island to the mainland with the aim of constructing a marina (Simeone and Bernal 2000). Based on this experience, it is recommended that the feasibility and the costs of using rocks overlaid on natural nest-type hollows and/or cracks be compared to that of constructing artificial nests. In both cases it is important to take into account the location, size of the population of penguins and the frequency of rains and ocean swells.

2. Predation
Initiated:

PERÚ: At Punta San Juan, the wall to keep out terrestrial predators such as the Andean fox has been almost 95% reconstructed with the support of international institutions such as the Oregon Zoo, Wildlife Conservation Society and from individual donations. Foxes found within the reserve before and during the reconstruction of the wall were removed through trapping.

New Recommendations and Solutions for the Short-Term.
CHILE
- Eradicate the existing populations of rats on Isla Pájaros 1 and 2. Evaluate the use of high frequency sounds that only affect predators and not penguins.
- Increase the availability of covered nests, with the aim of reducing the effects of aerial predators and nest floodings in Chile.
- Carry out a census of Southern sea lion (*Otaria byronia*) populations, which may be increasing considerably. These marine mammals presumably eat penguins and also may compete for breeding space.
  Note: Censuses of Southern sea lions are conducted periodically by the Chilean authorities. These data should be located and used.

PERÚ
- Evaluate with PROABONOS the possibility of not extracting guano in penguin nesting areas and in other guano reserves where the birds utilize zones with guano deposits, such as Punta Coles. Previous studies in Punta San Juan demonstrated that a great quantity of guano facilitates the construction of a higher number of excavated nests (Paredes and Zavalaga 2001). These nests then show greater reproductive success because hatchlings are protected from aerial predators as well as solar radiation.
- Finish the reconstruction of the wall at Punta San Juan to finally stop entry of foxes into the reserve.

3. Human Perturbation
Recommendations carried out since the PHVA:

PERÚ: In 1999-2000 the PROABONOS authorities coordinated a plan to better manage the extraction of guano from Punta San Juan through an agreement with

Wildlife Conservation Society. This agreement, A) takes into account the recommendations of the researchers at Punta San Juan, B) does not permit guano extraction in penguin nesting areas, C) permits the presence of volunteer observers that supervise the extraction work with the objective of minimizing the disturbance on the penguin colonies.

CHILE: SERNAP has initiated a process to create a Marine Reserve that in principle would encompass the Isla Damas and Isla Choros with co-work and active participation of the local fishermen.

New Recommendations and Solutions for the Short-Term

- Researchers should coordinate their efforts to avoid duplication of studies in the same colonies of penguins in Chile.
- In Perú, declare Isla Hornillos as a marine reserve/protected area because it is home to one of the largest colonies of Humboldt penguins.
- Evaluate the possibility of including Isla Pájaros, Grande, Tilgo, Huevos, etc. as protected areas in Chile.
- Promote/publicize information about the problems that affect the conservation of Humboldt penguins using many methods of communication, with a goal of reducing human interference/perturbation (tourism, artesanal fishing, collection of penguins for pets, etc.).

General Conservation Recommendations

1. Evaluate the development of ecotourism in the reserves or protected areas as an alternative to obtain funds that can finance research projects and conservation and management plans for Humboldt penguins. Carry out a pilot study to evaluate the impact of the public in breeding colonies. Involve local people (fishermen, students, etc.) in ecotourism activities.

2. Promote the exchange of information among field researchers in Chile and Perú as well as zoo and aquarium staff, with the goal of learning more about their care, management and conservation in the wild as well as in a captive setting.

3. Promote the participation of national and international volunteers in conservation activities for Humboldt penguins in Perú and Chile.

4. Initiate and create links between researchers and organizations dedicated to penguin rehabilitation such as SANCCOB in South Africa so that disaster response can be strengthened when problems such as those associated with chick loss in El Niño years occur.

FISHERIES INTERACTIONS

In Perú and Chile there are two types of fisheries: industrial and artesanal. Since the PHVA workshop in Olmue, Chile, many interactions with artesanal fisheries in both countries have been studied at the local level (e.g., Simeone et al. 1999, Majluf et al., in prep.) that enhance our understanding of the nature and magnitude of these interactions.

In central Chile (Simeone et al. 1999), we now know that the problem of fisheries interaction is primarily manifested in the winter (June through August), when the animals leave the breeding colonies and disperse into zones in which net-using fisheries seeking corvina *(Cilus gilberti*) are operating. In Perú, the problem primarily is with nets used to capture cojinova (*Seriorella violacea*) near Punta San Juan.

Research Priorities

Of the two themes identified at the PHVA workshop and those discussed at this workshop, the following are a high priority.

- Evaluate the nature and impact of industrial fisheries on Humboldt penguin and other seabird populations.
- Replicate the studies of fisheries interactions in the rest of the species' distribution range where there is no information, with the goal of obtaining estimates of total capture and its effect on the rates of natality/recruitment in local colonies.
- Study foraging patterns of the Humboldt penguin, its routes of movement and their relationship to fisheries to identify zones of potential conflict.
- Determine factors that affect the vertical distribution of the species with respect to artesanal fisheries and use that to predict the patterns of net use and consequently their impact on Humboldt penguin populations.
- Examine the consequences of the decline of anchovies on the composition of the diet of penguins and their energy budgets.
- Determine the rates of capture of penguins for food or for pets in Perú.
- Conduct an economic valuation of the use of penguins in tourism (and other attractive animal species) in the different parts of their range, where there are important concentrations with easy access.
- Make a registry of the geographic distribution of the fishing networks/cooperatives on the coasts of Chile and Perú, at the same time obtaining information about the use of different types of nets in each group. This information can be used to estimate the level of risk to which penguins are exposed in each zone.
- Prioritize the coastal zones of Perú and Chile, based on the information obtained in the two preceding points, as a basis for the establishment of marine protected zones

where activities of fisheries and tourism are regulated, and where the marine resources of the zones will be protected.

Problems and Solutions

1. **Artesanal Fisheries**
   Proposed solutions:
   a) Involve fishermen and public authorities in the problem by convening workshops.
   b) Design of devices to control the depth of nets and/or banish some kinds of nets.
   c) Modify the habits and schedules of the fishermen, creating areas of fisheries exclusion.

2. **Industrial Fisheries**
   Proposed solutions:
   a) Involve entrepreneurs, fishermen and public authorities in the problem with workshops and questionnaires.
   b) Design devices to release animals that end up being surrounded by the nets of the industrial fisheries.

3. **Increased Competency for Marine Resource Management**
   Proposed solutions:
   a) Involve authorities in the problem using workshops and assessments.
   b) Look for alternative management strategies for industrial fisheries.

4. **Human Consumption and Use of Penguins as Pets**
   Proposed solutions:
   a) Education programs and dissemination of information.
   b) Introduction of negative myths (e.g., eating penguins causes impotency).
   c) Create structures that revalue the use of live penguins.

RESEARCH AND MONITORING

Identified problems and status of implementation of recommendations from the Humboldt Penguin PHVA in 1998:

1. Standardize terminology and methodology
   Completed – standard terms as defined by PHVA are in use.

2. Census and monitoring
   a) Global estimate – completed for 1999 (one pass) and 2000 (2 passes) and 2001.
      Additional recommendations:
      - Recommend repeating annual census for another couple of years using equivalent methods at all sites. Re-emphasize what the standard methods are (weeks between counts, compensate for double counts).

- Important to do Perúvian and Chilean censuses simultaneously.
- Recommend establishing methods (multiple trained observers using "index" sites or other) for long-term monitoring.

b) Estimate reproductive population
Additional comments and recommendations:
- Data exist or are emerging for the reproductive population, e.g., for Islote Pájaro Niño (Simeone et al, accepted, Wallace et al, submitted, Meza et al. 1998) and Punta San Juan.
- Recommend identifying additional sites, establishing methods for each site for consistency and engaging in long-term monitoring (trained guards at protected sites, assistants, students, etc), to determine annual breeding effort.
- At all sites where we agree to monitor, get at least the number of reproductively active nests per year (both breeding seasons and possibly in between).
- At important sites where intensive monitoring is feasible, establish safe method for identifying birds and monitor the number of actively breeding birds (adults) throughout the year.
- Monitor the reproductive vs. the molting population.

New Research Needed

1. Find a safe, effective method(s) for individual identification (e.g. transponder chips).

Mortality Rates and Causes

1. Entanglement:
   a) Data are in preparation for Punta San Juan; data from beach counts published for parts of Chile (Simeone et al 1999). Need to gather more data from additional sites (see information from fisheries group).
   b) It is difficult to assess entanglement rates because fishermen know that species is protected.

2. El Niño:
   a) Use data from standardized annual censuses.
   b) Establish beach counts of mortality in selected areas during normal and El Niño years. Record body condition per standardized body condition score.
   c) Improve communication between researchers if banded birds are seen elsewhere.

3. Illegal hunting of eggs, chicks and adults:
   a) Quantifying this is extremely difficult and time-consuming.
   b) Focus efforts on education and community involvement, with particular emphasis on areas where there are reports of significant poaching

Reproductive Ecology

1. Determination of reproductive success - reproductive success at selected sites, monitor the number of active nests, eggs/nest, hatch rate, fledge rate, etc.:
   a) Data are available from Punta San Juan, Pájaro Niño Is. (Wallace et al, submitted), and some from Pan de Azucar Is.
   b) Use a standardized form to train people to record data.

2. Factors that affect reproductive success
   a) Food availability – in Chile, data on anchoveta and other species may be available; if so, we need to get data from the government. In Perú, data are available from IMARPE.
   b) Nest quality – record as part of reproductive success.
   c) Chick mortality – necropsy and observation.

We need to develop a simple necropsy protocol for field necropsies.

LEGISLATION AND EDUCATION

Overall, many of the recommendations from the Legislation and Education working group from the PHVA have not yet been implemented.

Legislation

1. Lack of interest by some governmental authorities
   There is regulation coming on marine reserves and protective areas. Overall, however, much more needs to be accomplished.
2. Execution/enforcement of laws that protect the Humboldt penguin.
   CONAMA has done some work but more needs to be accomplished.
3. Legal means for the protection and creation of marine reserves.
   There has been some improvement in the creation of reserves, one has been established, and another one will be created.

New Recommendations

1. We need to create an interface/oversight group to demonstrate what is not being accomplished under current legislation. This group would work to get governments and legislators to enforce current legislation.

Education

1. Conservation education, information, public relations, and public sensitization.
   Very little work has been done. Some information in schools but public awareness is limited.
2. Education in fishing communities.
   Little work has been done but some work has begun in schools within the past year.
3. Communication of integrated research.
   Update: some work has been done locally but not much on a wide scale. More work needs to be accomplished.

4. Sensitivity of local populations.
   Some work has been done within small communities, in schools, but not on a large scale. More work needs to be accomplished.
5. Education of human populations near nesting areas and enlisting the help of NGOs in penguin protection.
   Nothing has been accomplished for this to date.

New Recommendations:
1. Look at a few high-risk colonies and focus educational efforts on fishermen and the general public.
2. Have field researchers work within the communities, in schools, to promote conservation of the penguins and the marine environment.
3. Use the "service country" (Servicio País) program to include marine conservation and protecting penguin populations.
4. Work to educate legislators on the conservation of the penguins and the marine environment. These legislators may then be used to help enforce the current laws.

FISHERIES AND FOOD CROSS-SPECIES WORKING GROUP

There are several critical issues with respect to fisheries and penguin prey species:

FOOD RESOURCES

Fishing

Try to establish a new relationship between:
- reproductive success (breeding proportion, laying frequency, nesting success, fledgling success, age at first breeding)
- immature survival (all 4 species)
- recruitment to breeding populations (African)
- adult survival (in extreme cases for Galápagos, Humboldt)

Actions Recommended:
1. Ensure adequate escapement of forage fish (item should be included in MOU's).
2. Reduce bycatch of food fish for Magellanic penguins.
3. Maintain reproductive stock of mullets (Galápagos), i.e., avoid recruitment overfishing.
4. Measure adult and immature survival (of penguins) in good and bad food years.

<u>Climate change</u> (pertains to all species)

Actions Recommended:

1. Build models of populations (especially Galápagos and Humboldt). From models, assess the need to artificially feed chicks that would otherwise die (during periodic food shortages – same as above).
2. Request captive facilities to study ways to "de-imprint" hand-fed birds that are released to the wild because those released during the *Treasure* oil spill came back to humans to be fed.
3. If chick-feeding is used, monitor its success by banding and long-term (Not all participants agreed that banding is worth the risk and suggested that another, more harmless method should be developed).
   observations to assess subsequent recruitment to breeding populations.
4. Continue to investigate the use of artificial nest sites (e.g., for rain in Chile, thermal cover in Galápagos)

<u>Competition with other wild species</u> (e.g., seals, sea lions)
This is particularly a problem for African penguins in Namibia.

Actions Recommended:

1. Assess this problem using simple multi-species models.

INCIDENTAL CAPTURE

<u>Gill Net Capture</u> (pertains to all 4 species (if Galápagos fishery continues to expand).

Actions Recommended:

1. No gill nets should be allowed near breeding colonies (This item should be included in MOU's).
2. Provide incentives, mechanisms for artesanal fishermen to benefit from alternative uses of penguins (e.g., ecotourism) so that they have reason to protect penguins.
3. Request fisheries services to monitor gill net capture (SERNAPESCA, IMPARPE).
4. Create international pressure on governments and institutions to provide funds for monitoring (e.g. appeal to international treaties and conventions: CITES, CMS).
5. Investigate mitigation measures for reducing incidental catch of penguins.
6. Investigate overlap between foraging and fishing and transit areas.

<u>Shrimp Trawls</u>
This affects Magellanic penguins mid-water in southern Argentina. Gandini et al. (1999) have estimated 0.7% take of local population per year.

Actions Recommended:
1. Need on-board observer program to monitor and control, exists for shrimp take and bycatch, needs to include data gathering for penguin and other seabird incidental take.
2. Determine methods to improve fishing gear to reduce take of penguins.

<u>Deliberate take</u> (as bait or food) (pertains to Humboldt penguins in Perú and Chile)

Actions Recommended:
1. Educate fishermen.
2. Determine economic incentives to deter using penguins as bait or food (e.g., ecotourism).

ILLEGAL FISHERIES

Illegal fisheries usually act through the same mechanisms as legal fisheries, but there are two problems:
1. The magnitude of take is not known.
2. The magnitude of the take is very difficult to estimate, but it may be possible to control, theoretically.

Action Recommended:
1. Publicize the magnitude of this problem in order to pressure governments to enforce laws and regulations.

MONITORING PENGUINS CROSS-SPECIES WORKING GROUP

MAIN AIM
To improve understanding so that we can better manage penguin populations and improve their conservation status.

Monitoring is essential to determine/establish the result of actions (management, conservation, development etc.). Data collection is an essential tool in the formation of policy and subsequent legislation.

Priority Recommendations
1. Develop handbook(s) of protocols for monitoring of penguins.
   Design a standardized set of protocols in a handbook (e.g., as in CCAMLR handbook). This could be for a species, country, or locality (such a guide exists for Punta San Juan). Guidelines should be refined for species/localities. The guidelines must contain sufficient information for inexperienced personnel to follow. A handbook should contain basic information about the species and other aspects being monitored. It also must contain aims for different monitoring strategies.

2. Disseminate results from monitoring exercises.
   Further define and prioritize parameters to be monitored.

Types of Monitoring

1. Regular censuses to obtain estimates or an index of population size and trends.
2. Assess breeding population and proportion of population that is breeding. Monitor proportion of different nest sites where relevant.
3. Determine effects of human disturbance (e.g., tourism, research) on population size and productivity.
4. Establish survival/mortality factors for different age classes (e.g., 1st year vs. adult). Try to assess reasons for mortality.
5. Monitor number of oiled/entangled birds present in populations.
6. Monitor the effects of pollution incidents, e.g., follow up of rehabilitated birds from oil spills.
7. Monitor timing of aspects of life cycle (e.g., peak egg laying period, molt period etc). These data can be used when trying to minimize the impact of certain activities on the birds.
8. Monitor distribution of birds within colony. Show contraction or expansion of range. May have conservation implications.

General

1. Encourage local communities to assist/carry out monitoring work. Perhaps this could be done initially on a volunteer basis, with supervision.
2. Co-ordinate and synchronize monitoring efforts between range states (e.g., for a global census).
3. Monitor the populations and distribution of competitor species (e.g., seals, sea lions, other birds) and of prey species.
4. Monitor other related factors (e.g., tonnage/number of ships passing coastline, number of visitors to nature reserves/penguin colonies, weather parameters).
5. It would be desirable to monitor distribution and movements of penguins at sea, but this may not be possible on a continuous basis and fall under the auspices of research.
6. Disseminate/publish results of monitoring work.

THE RESEARCH/ CLIMATE/INCREASING REPRODUCTIVE SUCCESS CROSS-SPECIES WORKING GROUP

The group agreed that long term research is essential for providing the information we need in order to identify and address the conservation of these species. Long-term programs that are ongoing must be continued and new programs need to be initiated for those species or major populations for which there are none currently underway.

Long Term Research Goals

1. Basic breeding biology (e.g., effect of age structure on population, factors that affect breeding success).
2. Habitat value: components of terrestrial and marine habitats that are important to the population and population processes.
3. Foraging biology, especially data on catch-per-unit-effort.

SPECIES-SPECIFIC RESEARCH NEEDS

For each species, specific research needs were identified as well as researchers to conduct the work (see report in Section 2).

Humboldt penguins

- Dispersion at sea during key times, e.g., juvenile stage, pre-molt, non-breeding periods, adults during chick rearing.
- Determining characteristics of natural nests and how to improve nest sites.
- Determine catch-per-unit effort for penguins as a way to connect the marine environment to reproductive success.
- Quantify the risk of entanglement based on pattern of penguin use of the environment (penguin "highways," diving and swimming characteristics, areas of use during breeding and non-breeding seasons, patterns of use of fishing gear…); quantify entanglement at key sites.
- What allows juveniles to recruit (dispersal, areas at sea, body condition…)?

Galápagos penguins

- What makes a good nest? Can artificial nests improve reproductive success?
- Research on introduced predators.
- Research on pathogens, especially introduced or emerging disease, parasites, etc.
- Research on catch-per-unit-effort (CPUE).
- What allows juveniles to recruit (dispersal, areas at sea, body condition…)?

African penguins

- Information on catch-per-unit-effort (CPUE).
- Nest site characteristics and how to design artificial nests.
- Effective (socially acceptable) mitigation of seal and cat predation on penguins

- What allows juveniles to recruit (dispersal, areas at sea, body condition…)?
- Using information from CPUE and other aspects of site quality to determine advisability and feasibility of establishing new colonies.

Magellanic penguins
- How important is oil contamination to penguin populations?
- CPUE information.
- Identify important sites of at-sea distribution, especially during pre-molt.
- What allows juveniles to recruit (dispersal, areas at sea, body condition…)?

THE PROTECTION CROSS-SPECIES GROUP

The Protection Group identified international, regional and local recommendations.

INTERNATIONAL
1. Create a quick response network to respond to pollution and other environmental disasters anywhere in the world. This network would mobilize volunteers and resources to the disaster area and should identify the needs and risks and develop contingency plans and response protocols.
2. Develop MOUs to be submitted to the Bonn Convention to include the African penguin into the Convention on Migratory Species.
3. Bring VORTEX models up to date, including the new information on breeding success, census, etc. and use this information to produce a report to be sanctioned by the Spheniscid group and submitted to IUCN as the basis for our request to upgrade the Humboldt Penguin category from Vulnerable to Endangered.
4. We recommend international exchange about protection information between penguin experts and those with previous experience in this through workshops, web pages, magazines, etc.
5. Increase support to *Penguin Conservation* as an important means of disseminating information, trying to expand its scope to cover fisheries or other international legislation relating to penguins, listing national or international resources or agencies that exist.
6. Develop a geographic database identifying potential risk areas, relating transit routes of tankers and other transport ships, pollution sources, tourism developments to penguin colony distribution.
7. Re-emphasize and enforce the United Nation's International ban on the use of gillnets.

REGIONAL
1. Develop bi-national agreements to manage industrial fisheries on a regional basis (e.g., Perú-Chile, Namibia-South Africa, Argentina-Chile).
2. Increase communication between interdisciplinary groups working on a species that ranges in multiple countries to update and exchange information on a regular basis,

through regional species specific workshops, web pages, electronic bulletin boards/lists, etc.
3. Study penguin movements at sea to identify migration routes across borders and using this information as the basis for the establishment of a system of Marine Protected Areas that covers the range of the species.

LOCAL

1. Work with local governments to implement Marine Protected Area (MPA) systems covering the main penguin rookeries, penguin prey species and their foraging ranges. MPAs should regulate transit and other activities around rookeries, including fisheries and recreational activities.
2. Further studies of the distribution, abundance and movements of penguin populations are needed to prioritize areas to establish Marine Protected areas.
3. Work with local legislators to develop in-country laws to regulate or ban the use of gillnets around penguin rookeries or transit routes.
4. Develop and obtain support for local agencies enforcing anti-poaching laws.
5. Identify high-risk pollution sources affecting penguins and creating and enacting legislation to decrease or eliminate the risks of pollution.
6. Establish guidelines to control ecotourism access and timing of visits to penguin rookeries.

GENERAL WORKSHOP RECOMMENDATIONS

On the last afternoon, plenary discussions centered around the cross-species working group recommendations. Participants reached consensus on all recommendations included in this document. Additionally, it was recommended that the workshop endorse the development of Memoranda of Understanding between Perú and Chile (for Humboldt penguins) and South Africa and Namibia (for African penguins) under the terms of the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention). Participants unanimously supported this recommendation. These Memoranda of Endorsement are included as Appendix II and III of this document.

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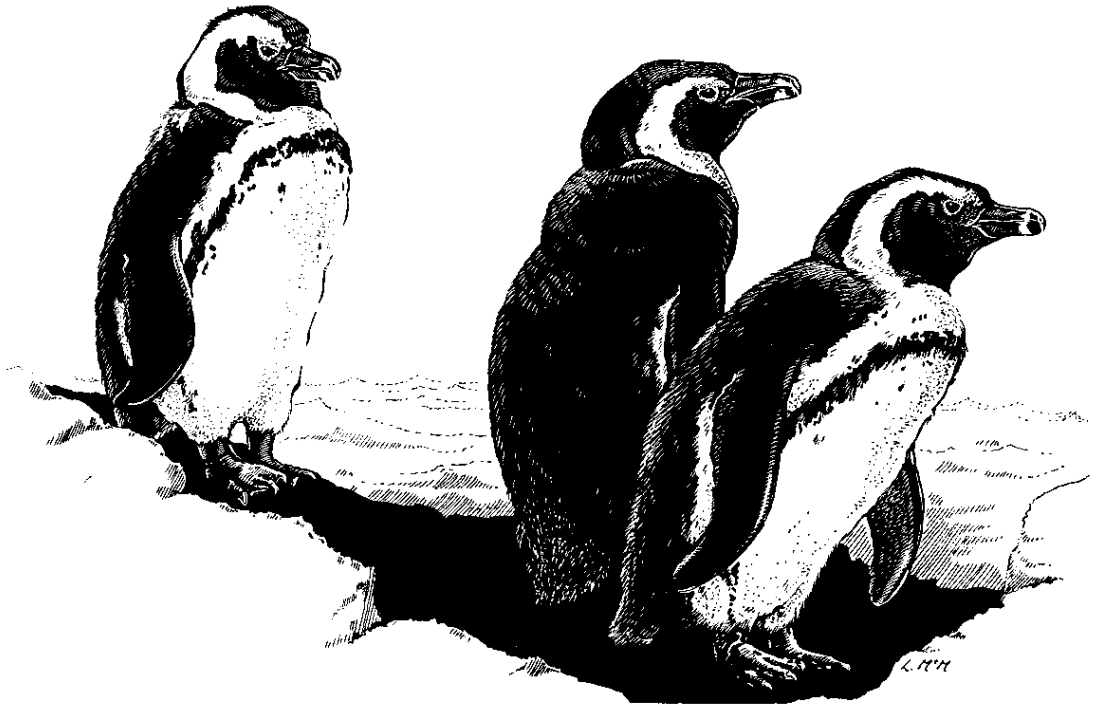
SPHENISCUS PENGUIN CONSERVATION WORKSHOP

9-10 September 2000
Universidad Católica del Norte, Coquimbo, Chile

FINAL REPORT



Section 2

Working Group Reports

AFRICAN PENGUIN WORKING GROUP REPORT

Participants: Gigi Crain, Rob Crawford, Francois Lampen, Mario Leshoro, Heather Urquhart, Phil Whittington, Anton Wolfaardt

Update on the Goals of the 1999 PHVA

1. COLONY MANAGEMENT

Initiated

- management plan for Dassen Island.
- cat hunting on Robben Island, but not sustained.
- trapping of mammalian predators at Stony Point, but now ceased.
- communication of issues ongoing.
- research being undertaken to look at frequency of avian malaria and other diseases. both in wild and captive populations.
- Robben Island declared world heritage site.
- Robben island study set up to quantify impact of tourism.
- Lambert's bay development of tourism and interpretation program.
- artificial burrows (Lambert's bay/Robben island/Dassen island).
- rescue/rehab of orphaned chicks.

Not Initiated

- maintain stud book.
- management plans for many reserves.
- review of current legislation and improved enforcement of legislation in South Africa and Namibia, separate but overarching issue.
- Insufficient management of seal predation.
- guano scraping in Namibia.
- re-establishment of extinct colonies or establishment of new colonies.
- fire management.

New Issues

- investigate sterilization of feral cats.
- minimize risk of disease transmission.
- control of vehicle traffic on Robben Island.
- Mario requests letters from international representatives to Robben Island Museum to highlight the importance of penguins at Robben Island, urging a management plan for the Island.
- entanglement of penguins.
- investigate ways of desensitizing penguins especially at areas of tourism, by using models of sleeping penguins to calm them down.

2. OILING

Initiated
- developing and testing rehabilitation techniques.
- protocols and video developed to train personnel.
- proposal/request for funding to set up a team to do follow-up work.
- large amounts of public awareness resulted from *Treasure* oil spill (June 2000 near Cape Town, South Africa).
- looking into setting up new rehab centers.

Not Initiated
- lobbying for increased political will to improve and enforce legislation.
- creating incentives to deter potential polluters.

New Issues
- review current legislation and make proposals/lobby for improvement.
- investing in preventive measures.
- lobbying both locally and internationally for more responsible management of oil issues.
- maintain public awareness campaigns and target *Treasure* oil spill (June 2000 near Cape Town, South Africa) volunteers.
- testing different detergents.
- improved facilities to deal with oiling accidents.
- testing techniques for feeding birds.
- setting up rehab centers at or near colonies (need for lobbying to achieve this in some areas).
- maintain biological reference database.

3. PREDATION

Initiated
- assessment of problem at Dyer Island and Lambert's Bay, but need further research.

Not Initiated
- management of seal predation.
- research on penguin-seal interactions.
- document or workshop on seals.
- assessment of impact of gulls on penguins.

New Issues
- investigate possibility of sterilizing seals and electric fences to deter seals (contact Jonathan Banks: banks@lincoln.ac.nz)

4. FISHERY-RELATED ISSUES

- realization that initial recommendations were over-ambitious. As a matter of urgency, the need to determine food requirements and the predicted escapement of fish required for penguin population is needed.
- food supply protection.
- reduce potential for incidental mortality by banning gill nets around islands.
- proposal to achieve the above (ban on gill nets), as has been put forward for areas around Robben and Dassen Islands.

5. OVER-ARCHING ISSUES

- need for a memorandum of agreement between South Africa and Namibia
- review of seabird legislation and improvement of enforcement
- lobbying from both local and international sources to put pressure on policy makers, especially regarding development that may have an effect on penguin population.

6. INTERNATIONAL ISSUES

- lobbying for better legislation/enforcement of oil-related issues.
- creating incentives to deter potential polluters.
- investigate sterilization of cats.
- minimize disease transmission.
- investigate using sleeping penguin models or other methods to desensitize penguins near tourists.
- reduce entanglement of penguins in fishing lines/nets.
- developing and testing cleaning/feeding techniques.
- protocols and video to train oil spill personnel.
- setting up team to do follow-up work after oil spills.
- researching food requirements/protecting food supply.
- banning gill nets.

7. CHAMPIONS

RESEARCH TO DETERMINE FOOD REQUIREMENTS & FOOD SUPPLY PROTECTION
Rob Crawford

BANNING OF GILL NETS AS IS IN PROGRESS FOR ROBBEN & DASSEN ISLANDS
Anton Wolfaardt

MEMO OF AGREEMENT BETWEEN SOUTH AFRICA AND NAMIBIA
John Cooper

REVIEW OF SEABIRD LEGISLATION AND IMPROVEMENT OF ENFORCEMENT
Anton Wolfaardt
Rob Crawford

INVESTIGATE POSSIBILITY OF STERILIZING SEALS
Heather Urquhart (New England Aquarium)

INVESTIGATE ELECTRIC FENCES TO DETER SEALS
Jonathan Banks
AJ Williams
Jeremy David

MANAGEMENT OF SEAL PREDATION
Anton Wolfaardt
Chris Martens
AJ Williams
Jean Paul Roux

RESEARCH ON PENGUIN-SEAL INTERACTION
Jeremy David
Phil Whittington

INVESTIGATE STERILIZATION OF CATS
Anton Wolfaardt

MINIMIZE RISK OF DISEASE TRANSMISSION
Francois Lampen
Mike Cranfield
Estelle van der Merwe

CONTROL OF VEHICLES ON ROBBEN ISLAND
Mario Leshoro

URGING A MANAGEMENT PLAN FOR ROBBEN ISLAND
Mario Leshoro

INVESTIGATE USING SLEEPING PENGUIN MODELS AND OTHER METHODS TO DESENSITIZE PENGUINS NEAR TOURISTS
Anton Wolfaardt

REDUCE ENTANGLEMENT OF PENGUINS IN FISHING LINES/NETS
Mario Leshoro
Phil Whittington
Anton Wolfaardt

REVIEW CURRENT LEGISLATION/PROPOSE IMPROVEMENTS/INVEST IN PREVENTIVE MEASURES
Lynne Jackson
Sarah Scarth
Rob Crawford

LOCAL & INTERNATIONAL LOBBYING REGARDING DEVELOPMENT THAT MAY IMPACT PENGUINS
Heather Urquhart (New England Aquarium)
AJ Williams
Cynthia Cheney
Jennifer Murray
IFAW
SANCCOB

LOBBYING LOCALLY & INTERNATIONALLY FOR BETTER MANAGEMENT OF PENGUIN ISSUES AND KEEPING UP PUBLICITY FROM *TREASURE* OIL SPILL (JUNE 2000 NEAR CAPE TOWN, SOUTH AFRICA)
SANCCOB
New England Aquarium
AJ Williams
Cynthia Cheney
Jennifer Murray
IFAW

TESTING DIFFERENT DETERGENTS
International Bird Rescue Center (Jay Holcomb)
Lynne Jackson

TESTING TECHNIQUES FOR FEEDING BIRDS
New England Aquarium
SANCCOB
International Bird Rescue Center

SETTING UP REHAB CENTERS AT OR NEAR COLONIES
Mario Leshoro
Jean Paul Roux
Norbert Klages
SANCCOB

BARGE TO DEAL WITH ACCIDENTS
Lynne Jackson
Rob Crawford

MAINTAIN STUDBOOK
Heather Urquhart (New England Aquarium)
Steve Sarro (Baltimore Zoo)

MANAGEMENT PLANS FOR RESERVES/COLONIES
Shaun Davis
Mario Leshoro
other reserve/colony managers

FIRE MANAGEMENT
Shaun Davis
Mario Leshoro and other reserve/colony managers

CREATING INCENTIVES TO DETER POTENTIAL POLLUTERS
Lynne Jackson
AJ Williams
Phil Whittington
Endangered Wildlife Trust

MAINTAIN BIOLOGICAL REFERENCE DATABASE
Francois Lampen

GALAPAGOS AND MAGELLANIC PENGUIN WORKING GROUP

Issues affecting the conservation of Galapagos and Magellanic Penguins:

12. Climate change
13. Fisheries
14. Oil pollution
15. Tourism
16. Genetic Diversity
17. Exotic species
18. Lack of information
19. Lack of political support
20. Diseases
21. Habitat Loss
22. Financial support

Galapagos Problems	**Magellanic Problems**
1. Fisheries	1. Fisheries
2. Climate change	2. Oil pollution
3. Small population size; Isolated distribution	3. Climate change

GALAPAGOS PENGUINS

Fisheries Action Items

4. The Galapagos Islands should become a "true" protected marine reserve where all fisheries are prohibited.
   - Organize a Population and Habitat Viability Assessment Workshop Responsible: Susie Ellis/CBSG; within 1 year.

   - Create a resolution that addresses penguin problems in the Galapagos (all of us, Sept. 2000); Dee will take it to IUCN to place on the international stage (October 2000). BirdLife International should also be approached for endorsement (John Cooper, Oct. 2000). Send resolution to CEDENMA and Charles Darwin

Foundation and Galapagos National Park Service (Ecuador) for concurrence (Hernan Vargas will coordinate – Oct. 2000).

5. Prohibit development of any new fisheries and freeze current levels of fishing pressure. Enforce existing laws, including the immigration law, at all levels from national to local. Publicize court/enforcement actions selectively, via media, e-mail.
   - Invite legislators to the PHVA .
     Responsible: Hernan Vargas, Susie Ellis; 2001

   - Seek funding for another patrol boat (or airplane) and funds for maintenance and operations.
     Responsible: Mark Horner will get cost estimates for a surplus boat and maintenance (June 2001).

   - At the same time, seek changes in fishing regulations to require fishers to place GPS sensors on boats (at peril of loss of license) to monitor compliance with regulations. Regulations must be adopted by the cooperative management council (Junta de Manejo Participativo - H de MP); pressure must be placed on the Junta.

   - Develop funding to implement a new NGO in the Galapagos to put pressure on the Junta.
     Responsible: Susie Ellis, Tom Keating, AZA Penguin TAG to investigate in 2001.

   - Create a "penguin conservation" Web site, and link with Penguin TAG, Friends of the Galapagos, the Barham's, other Web sites to distribute publicity.
     Responsible: Mike Bingham, January 2001.

6. Prohibit use of nets in fisheries and freeze expansion of artesanal fisheries into western Galapagos.
   - Same action items as for compliance with regulations
     Responsible: Hernan Vargas will produce a technical report to request action by the H de MP (Jan 2001).

CLIMATE CHANGE ACTION ITEMS

4. Create better nest sites.
   - Investigate current programs testing artificial nests in Humboldt and African penguins.
     Responsible: Hernan Vargas, Mary Jo Willis.
   - Seek funding to support nest programs if need is identified.
     Responsible: Sea World, Sherry Branch, July 2001.

5. Rehabilitation/supplemental feeding for birds (especially juveniles) that are in the worst shape during severe El Niño/La Niña events. We recognize that this will be

complex, expensive and difficult to implement. It is not necessary immediately, but should be kept in mind. The group will table this issue but continue to monitor the need for this kind of initiative.

6. Provide for consistent, annual censuses. Expand monitoring to include body condition during El Niño years.
   Responsible: Hernan Vargas, July 2001)
   - Create funding sources.
     Responsible: Sherry Branch, Sea World, July 2001.

SMALL POPULATION SIZE ACTION ITEMS

4. Prevent the introduction of exotic predators on pristine islands; control predators where they currently exist.

   Funding is essential (see above action items for Sea World July 2001). Monitoring of cats and rats on Fernandina and Isabela should continue, as well as cat control in selected areas.

5. Monitor wildlife diseases; prevent human-caused transmission of new diseases. Investigate historic genetic diversity for comparison with current. Promote scientific investigation of Galapagos penguins in general.

   These are ongoing projects.
   Responsible: Gary Miller, Hernan Vargas, Elaine Akst, 2004 for completion.
   Disease workshop Oct. 2000).

6. Promote a broad education program.
   Galapagos has a school education program. The new Web site will also serve part of this function, as will links to other Web resources. Penguin TAG has new major educational initiative scheduled (April/May 2001). Write articles/press releases for popular media.

MAGELLANIC PENGUINS

Fisheries action items

2. Gill net fisheries (artesanal fisheries).
   - Change gear to purse seines, provide incentives to do this. Prevent the use of unattended nets. Encourage NGO's to alert governments to change laws and of the need to provide incentives. Query USA west coast sources and others (Ed Melman, John Cooper?) to see how gill nets were removed from Pacific coastal and other fisheries. Bring together fishermen, legislators and NGO's to decide

on how to bring this about. Needs to happen in all countries (including Brazil). How to fund?

2. Bycatch from commercial trawlers.
   - Need to quantify bycatch in terms of both quantity and species taken, needs long-term monitoring and research. Need to inform the public of the magnitude of the problem – wasted resources.
     Responsible: Dee Boersma and Esteban Frere.

4. Introduced species (especially salmonids).
   - Recommend to provincial governments (Argentina) that there be no salmon introductions into the range of Magellanic penguins. If proposals for introductions come forward, produce a "white paper" on ecological concerns surrounding introductions.
     Responsible: G. Harris, Fundación Patagonia Natural.

4. Overfishing (harvesting down the food web).
   Extend "no-fishing zone" closures past February, into the end of April. Establish new marine protected areas. Recommend that there be no inshore fisheries (within 30 miles of coast) in the Falklands (how?). Restrict industrial fishing from areas of known concentrated penguin use at sea (wintering and foraging areas for fledglings). Argentina and the Falklands should establish an integrated series of marine reserves and zones, subject to adaptive management based on continuing research and monitoring, to benefit all species (fish, seabirds, marine mammals).

Oil Pollution action items

4. Oil transport. End dumping of bilge water.
   We need to discuss how to accomplish this. Survey to determine how important the problem still is.
   Responsible: Dee Boersma, ongoing studies.

5. Oil development.
   - Get governments to enforce strict standards for development on new oil fields. Publicity campaigns needed. Need more information on distributions of birds on land and at sea.

     Responsible: Dee Boersma, Klemens Putz, ongoing.

6. Lack of prevention / spill response options.

Climate change action items

2. Monitoring/Long-term research
    - Consistent funding is needed to maintain studies (~ $100,000/yr for Argentina alone). Many studies are ongoing.

    - We need to determine the distribution and abundance of Magellanic penguins in Chile (research priority). (Comment: we could prioritize surveys of outer coast; this is thought to be where most birds located).

HUMBOLDT PENGUIN: HABITAT CONSERVATION AND MANAGEMENT

Participants: Rosana Paredes, Braulio Araya, Milena Roca, Trudie Hinckle, Jose Torres

Main Problems:

1. Lack of nests with cover

1.1 RECOMMENDATIONS CARRIED OUT SINCE THE 1998 PHVA.

PERÚ: In 1999, two colonies of artificial nests were created in areas previously not used by the penguins. This was done to expand the nesting zones and to increase the availability of covered nests in Punta San Juan. These nests were not used, probably because of the decrease in the breeding population of penguins and the absence of recruits after the 1997-1998 El Niño

CHILE: There was an attempt to increase the native vegetation in Algarrobo with the goal of preventing erosion resulting from rains. This effort was not successful because the gulls took the new plants as nesting material. New efforts, with other kinds of native vegetation will be performed in the following seasons.

1.2 RECOMMENDATIONS AND SOLUTIONS FOR THE SHORT-TERM.

PERÚ

- A proposal has been sent to the Brookfield Zoo to investigate the use of models and recordings of vocalizations of Humboldt penguins in the colonies where there are artificial nests. The goal of this study is to attract other penguins that will use these nests in new areas in Punta San Juan.

- Based on the results of this study, we will likely recommend that it be repeated in other guano reserves where Humboldt penguins live, such as Punta Coles and Isla Pachacamac.

CHILE

- There is an ongoing artificial nest utilization study, initiated at Isla Pájaro Niño, Algarrobo, by the Denver Zoo. It will take into account the designs of previous artificial nests used in South Africa and Perú, considering the differences in habitat

and climate (frequent rains) in this location. Currently, these models have been installed on the Island waiting for occupants.

- At Isla Pájaro Niño, penguins successfully used the hollows constructed with rocks overlaid to join the island to the mainland with the aim of constructing a marina (Simeone and Bernal 2000). Based on this experience, it is recommended that the feasibility and the costs of using rocks overlaid on natural nest-type hollows and/or cracks be compared to that of constructing artificial nests. In both cases it is important to take into account the location, size of the population of penguins and the frequency of rains and ocean swells.

2. Predation

2.1 Recommendations carried out since the 1998 PHVA.

PERÚ: At Punta San Juan, the wall to keep out terrestrial predators such as the Andean fox has been almost 95% reconstructed with the support of international institutions such as the Oregon Zoo, Wildlife Conservation Society and from individual donations. Foxes found within the reserve before and during the reconstruction of the wall were eliminated through trapping.

2.2 Recommendations and Solutions for the short-term.

PERÚ

- Evaluate with PROABONOS the possibility of not extracting guano in penguin nesting areas in other guano reserves where the birds utilize zones with guano deposits, such as Punta Coles. Previous studies in Punta San Juan demonstrated that a great quantity of guano facilitates the construction of a higher number of excavated nests. These nests then show greater reproductive success because hatchlings are protected from aerial predators as well as solar radiation.
- Finish the reconstruction of the wall at Punta San Juan to finally stop entry of foxes into the reserve.

CHILE

- Eliminate the existing populations of rats on Isla Pájaros 1. Evaluate the use of high frequency sounds that only affect predators and not penguins.
- Increase the availability of covered nests, with the aim of reducing the effects of aerial predators in Chile.
- Carry out a census of Southern sea lion (*Otaria byronia*) populations, which may be increasing considerably. These marine mammals presumably eat penguins and may also compete for breeding space.
  Note: The Chilean authorities conduct censuses of Southern sea lions periodically. These data should be located and used.

3. Human Perturbation

3.1 Recommendations carried out since the 1998 PHVA.

PERÚ: In 1999-2000 the PROABONOS authorities coordinated a plan to better manage the extraction of guano from Punta San Juan through an agreement with Wildlife Conservation Society. This agreement, A) takes into account the recommendations of the researchers at Punta San Juan, B) does not permit guano extraction in penguin nesting areas, C) permits the presence of volunteer observers that supervise the extraction work with the objective of minimizing the disturbance on the penguin colonies.

CHILE: SERNAP has initiated a process to create a Marine Reserve that in principle would encompass the Isla Damas and Isla Choros.

3.2 Recommendations and Solutions for the Short-Term.

- Researchers should coordinate their efforts to avoid duplication of studies in the same colonies of penguins in Chile.
- In Perú, propose Isla Hornillos as a marine reserve/protected area because it is home to one of the largest colonies of Humboldt penguins.
- Evaluate the possibility of including Isla Pájaros, Grande, Tilgo, Huevos, etc as protected areas in Chile.
- Promote/publicize information about the problems that affect the conservation of Humboldt penguins using many methods of communication, with a goal of reducing human interference/perturbation (tourism, artesanal fishing, collection of penguins for pets, etc.).

General Conservation Recommendations

1. Evaluate the development of ecotourism in the reserves or protected areas as an alternative to obtain funds that can finance research projects and conservation and management plans for Humboldt penguins. Carry out a pilot study to evaluate the impact of the public in breeding colonies. Involve local people (fishermen, students, local residents, etc.) in ecotourism activities.

2. Promote the exchange of information among field researchers in Chile and Perú as well as zoo and aquarium staff, with the goal of learning more about their care, management and conservation in nature as well as in a captive setting.

3. Promote the participation of national and international volunteers in conservation activities for Humboldt penguins in Perú and Chile.

4. Initiate and create links between researchers and organizations dedicated to penguin rehabilitation such as SANCCOB in South Africa so that disaster response can be strengthened when problems such as those associated with chick loss in El Niño years occur.

HUMBOLDT PENGUIN: FISHERIES INTERACTIONS

Participants: Mariano Bernal, Patricia Majluf, Leonardo Núñez, Alejandro Simeone

Introduction

In Perú and Chile there are two types of fisheries: industrial and artesanal. Since the PHVA workshop in Olmue, Chile, many interactions with artesanal fisheries in both countries have been studied at the local level (e.g., Simeone et al. 1999, Majluf et al., in prep.) that enhance our understanding of the nature and magnitude of these interactions.

In central Chile, we now know that the problem of fisheries interaction is primarily manifested in the winter (June through August), when the animals leave the breeding colonies and disperse into zones in which net-using fisheries seeking corvina *(Cilus gilberti*) are operating. This is an artesenal fishery that is done all year from the I to the X region, in beach zones and in bays. It is necessary to document this fishery at the regional level to identify and prioritize the risks (and in which areas it presents risks) for penguins. At the same time, the capture of penguins for bait should be documented and evaluated.

In Perú, the problem primarily is caused by nets used to capture cojinova (*Seriorella violacea*) near Punta San Juan. In reality, the capture of cojinova at the national level has nearly disappeared and for this reason the use of nets like these is limited. Nonetheless, after the 1997-1998 El Niño, the penguins of Perú had changed their distribution and actually were more dispersed and less concentrated in Punta San Juan. This redistribution resulted in a large proportion of penguins in Perú in zones that were less protected than Punta San Juan; this caused disturbance and direct or incidental capture at greater risk.

Research Priorities

Of the themes identified at the PHVA workshop and discussed at this workshop, the following are high priority. Additionally, we have added new themes to the list below, indicated with a bullet.

- Evaluate the nature and impact of industrial fisheries on Humboldt penguin and other seabird populations.

Note: SERNAPESCA (Chile) and the Fisheries Ministry (Perú) should take the responsibility of monitoring beaches and coves/inlets to evaluate net-caused mortality (and keep records).

- Replicate the studies of fisheries interactions in the rest of the species' distribution range where there is no information, with the goal of obtaining estimates of total capture and its effect on the rates of natality/recruitment in local colonies.
- Study foraging patterns of the Humboldt penguin, its routes of movement and their relationship to fisheries to identify zones of potential conflict.

  Note: Important literature has been produced (e.g., Culik and Luna, 1997, Luna and Culik 1999, Culik et al. 1998) on activity and range of feeding during the breeding season. There also are many ideas about dispersion through sitings of marked animals (e.g. Wallace et al. 1999) and through satellite tracking (Culik and Luna 1997). For Perú, there is one pilot study (with two animals) examining the range of penguins of Punta San Juan in the breeding season (Boersma et al. unpublished data) and it showed that animals banded in Punta San Juan went all the way to Valparaíso during the 1997-1998 El Niño. All that remains is to determine the movement patterns during the periods before and after molting and during El Niño events for both countries (Culik et al. 2000).
- Determine factors that affect the vertical distribution of the species with respect to artesanal fisheries and use that to predict the patterns of net use and consequently their impact on Humboldt penguin populations.

  Note: In general more information is needed about biology, distribution and abundance of resources of the artesanal fisheries to evaluate the probability of capture of penguins by these fisheries.
- Examine the consequences of the decline of anchovies on the composition of the diet of penguins and their energy budgets.
- Determine the rates of capture of penguins for food or for pets in Perú.

  Note: This point ought to be done primarily in other zones where the Humboldt penguin is concentrated, apart from Punta San Juan.
- Conduct an economic evaluation of the use of penguins (and other attractive animal species) in tourism in the different parts of their range, where there are important concentrations with easy access.
- Make a registry of the geographic distribution of the fishing networks/cooperatives on the coasts of Chile and Perú, at the same time obtaining information about the use of different types of nets in each group. This information can be used to estimate the level of risk to which penguins are exposed in each zone.
- Prioritize the coastal zones of Perú and Chile, based on the information obtained in the two preceding points, to be used as a basis for the establishment of marine protected zones where activities of fisheries and tourism are regulated, and where the marine resources of the zones will be protected.

PROBLEMS AND SOLUTIONS

1. Artesanal Fisheries

Proposed solutions:

a) **Involve fishermen and public authorities in the problem by convening workshops.**
Organize stakeholder workshops (fishermen and authorities independently) to discuss the problem and seek solutions together, in a way that will minimize the incidental capture of penguins doing as little harm as possible to the fishermen's 'take'.

Note: To make an economic valuation on a biological system and to present the case to the fishermen and fisheries managers, informing them of the potential losses that would occur if the health of the ecosystem is not maintained, and for the case of the Humboldt penguin in particular, of the potential attraction of this bird for tourism. The methods of protection could channel the Consejos or Direcciones Zonales de Pesca (interdisciplinary organization that involves local universities, NGOs, government, fishermen, crew members, riggers and industrial people, maritime governance bodies, SERNAPESCA, etc.) more effectively (in Chile) and through others in the Subsecretariat of Fisheries, which sets the legal regulations related to the Humboldt penguin.

b) **Design of devices to control the depth of nets and/or to banish some kinds of nets.**
Given that penguins generally become entangled within the first five meters of depth, it would be desirable to design a mechanism that regulates the depth of nets. Alternatively, it would be possible to design a device that frightens away penguins and other species that could become entangled (e.g., other birds and marine mammals).

Note: This is a lower priority. We know that the problem is not that the fishermen use nets at different depths according to the species they are aiming to catch; if not, the fishermen change rigging. This simplifies the problem of identifying the type of rigging that needs to be eliminated in the short or long term.

c) **Modify the habits and schedules of the fishermen, creating areas of fisheries exclusion.**
Look for a way that fishermen could modify some of their habits and schedules so that their tasks can be carried out in the times and zones where they are least likely to entangle penguins.

Note: Changing the behavior of fishermen is not likely. A higher priority is the creation of fisheries exclusion zones or marine reserves, established on scientific, economic and social criteria. During the process of reserve establishment, the 'users' should be involved so that they can see the advantages from the

protection of the resources in the reserve. At the same time, it would be useful to find ways to eliminate drift nets, medium term, since this would reduce the primary risk to the animals. In the reserve design, it would be useful to establish zoning for the use of different kinds of fishing apparatus within the reserves.

2. Industrial Fisheries

Proposed solutions:

a) **Involve entrepreneurs, fishermen and public authorities in the problem with workshops and questionnaires.**
Organize workshops with all the stakeholders to collaboratively discuss the problem and look for solutions.

Note: In order to do this, scientists and conservationists must explain the problem from the point of view of resources and try to reach a consensus, taking into account the needs of the fisheries sector.

b) **Design devices to release animals that end up being surrounded by the nets of the industrial fisheries.**
Adapt or design exclusion devices so that birds can escape nets when they are caught/encircled.

Note: Low probability of implementation medium-term. This is expensive and difficult to implement and maintain in all of the fisheries ports and fisheries zones

3. Increased Competency for Marine Resource Management

Proposed solutions:

a) **Involve authorities in the problem using workshops and assessments.**
Organize workshops with public authorities to explain the potential effects of the ecosystem changes caused by industrial fishing activities and the benefits of considering other species in the design of fishing policies.

b) **Look for alternative management strategies for industrial fisheries.**
This would permit the recuperation of anchovetas through directing fishing efforts toward other species (e.g., jurel and caballa) during the times of anchoveta spawning, at the same time reducing the pressure on fish and predation on their larvae.

4. Human Consumption and Use of Penguins as Pets

Proposed solutions:

a) **Education programs and dissemination.**
These kinds of programs would provide information/knowledge about the impact of certain customs on penguin populations and how avoiding these practices would enhance the conservation of the species.

Note: Here again it is useful to discuss the economic value of penguins as a tourist resource and as an ecosystem health indicator. Based on these concepts, a large number of people could become involved in conservation programs for the species.

b) **Introduction of negative myths (e.g., eating penguins causes impotency).**
This could create an aversion to the consumption of penguins.

Note: We also need to determine how to elevate the Humboldt penguin as a 'flagship' avian species for the public in general (positive sentiment). In this way we could gain popular support to make changes in policy in management that would lead to better management of fisheries that could contribute to the conservation of penguins and their habitat in general.

c) **Create structures that revalue the use of live penguins.**
The involvement of fishermen in programs of ecotourism around penguin colonies could lead to a revaluation of the species, and that would prevent its capture.

Note: This is very important. Creating international pressure on national institutions could lead to better recognition of the different international conventions and national legislation in effect (IUCN, CMS, CITES). In a limited way and in extreme cases, promote the use of international threats (boycotts or fishing embargoes) to eliminate or modify the types of fisheries that have been shown to cause significant damage to penguin populations.

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HUMBOLDT PENGUIN: RESEARCH AND MONITORING

Identified problems and status of implementation of recommendations from the PHVA in 1998:

1. Standardize terminology and methodology
   Completed – standard terms as defined by PHVA are in use.

2. Census and monitoring
   a) Global estimate – completed for 1999 (one pass) and 2000 (2 passes)
      Additional recommendations:
      - recommend repeating annual census for another couple years using equivalent methods at all sites. Re-emphasize what the standard methods are (weeks between counts, compensate for double counts).
      - Important to do Perúvian and Chilean censuses simultaneously.
      - Recommend establishing methods (multiple trained observers using "index" sites or other) for long-term monitoring.

   b) Estimate reproductive population
      Additional comments and recommendations:
      - data exist or are emerging for the reproductive population, e.g., for Islote Pájaro Niño and Punta San Juan.
      - recommend identifying additional sites, establishing methods for each site for consistency and engaging in long-term monitoring (trained guards at protected sites, assistants, students, etc), to determine annual breeding effort.
      - At all sites where we agree to monitor, get at least the number of reproductively active nests per year (both breeding seasons and possibly in between).
      - At important sites where intensive monitoring is feasible, establish safe method for identifying birds and monitor the number of actively breeding birds (adults) throughout the year.
      - Monitor the reproductive vs. the molting population.

New Research Needed

1. Find a safe, effective method(s) for individual identification:
   a) bands (check with African, Magellanic and little penguin researchers on adverse effects like mortality, injury, energetics, band loss, etc.)
   b) transponders
   c) individual spot patterns
   d) other?
   e) Standardize and coordinate band codes and usage so no overlap

Mortality Rates and Causes

1. Entanglement:
   a) Data are in preparation for Punta San Juan; data from beach counts published for parts of Chile. Need to gather more data from additional sites (see information from fisheries group).
   b) It is difficult to assess entanglement rates because fishermen know that species is protected.

2. El Niño:
   a) Use data from standardized annual censuses.
   b) Establish beach counts of mortality in selected areas during normal and El Niño years. Record body condition per standardized body condition score.
   c) Better communication between researchers if banded birds are seen elsewhere

3. Illegal egging and hunting of chicks and adults
   a) Quantifying this is extremely difficult and time-consuming.
   b) Focus efforts on education and community involvement, with particular emphasis on areas where there are reports of significant poaching

Reproductive Ecology

1. Determination of reproductive success - reproductive success at selected sites, monitor the number of active nests, eggs/nest, hatch rate, fledge rate, etc.:
   a) Data are available from Punta San Juan (Paredes and Zavalaga 2001), Islote Pájaro Niño (Wallace et al. 1999), and some from Pan de Azucar.
   b) Use a standardized form to train people to record data.

2. Factors that affect reproductive success:
   a) Food availability – in Chile, data on anchoveta and other species may be available; if so, we need to get data from the government. In Perú, data are available from IMARPE.
   b) Nest quality – record as part of reproductive success.
      - artificial nests – (see habitat group report)
   c) Chick mortality – necropsy and observation.

We need to develop a simple necropsy protocol for field necropsies

Bioenergetics and Foraging Ecology

This depends primarily on the fisheries.

1. Bioenergetics – some data are available now (Luna and Culik 2000). Data on the bioenergetics of small chicks are coming out. There is a continued focus on food availability – identification of prey items, and the energy and nutritional content of prey items.

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HUMBOLDT PENGUIN: LEGLISLATION AND EDUCATION

Legislation

Problems and updates

1. Lack of interest by governmental authorities
   Update: regulation coming on marine reserves and protective areas. Overall, much more needs to be accomplished.
2. Execution/enforcement of laws that protect the Humboldt penguin.
   Update: Subsecretaria de Pesca has done some work but more needs to be accomplished.
3. Legal means for the protection and creation of marine reserves.
   Update: There has been some improvement in creation of reserves, one established but more work needs to be accomplished.
4. Legislation.
   Update: there are some laws on paper but they need to be enforced/carried through. Legislators need to work on upholding the laws.

New Recommendations

1. We need to create an interface/over-site group to demonstrate what is not being accomplished under current legislation. This group would work to get governments and legislators to enforce current legislation.

Education

1. Education, information, public relations.
   Update: very little work has been done. Some information in schools but public awareness is limited.
2. Public sensitization.
   Update: very little work. More needs to be accomplished.
3. Public education to protect penguins.
   Update: very little work has been done. More needs to be accomplished.

4. Conservation education.
   Update: little has been done. More needs to be accomplished.

5. Education in fishing communities.
   Update: little has been done. Some work has begun in schools within the past year. More needs to be accomplished.

6. Communication of integrated research.
   Update: some work has been done locally but not much on a wide scale. More work needs to be accomplished.

7. Sensitivity of local populations.
   Update: some work has been done within small communities, in schools, but not on a large scale. More work needs to be accomplished.

8. Education of human populations near nesting areas.
   Update: nothing has been done. More to be accomplished.

9. Enlist the help of NGOs in penguin protection.
   Update: nothing has been done. More work needs to be accomplished.

New Recommendations

1. Look at a few high-risk colonies and focus educational efforts on fishermen and the general public.

2. Have field researchers work within the communities, in schools, to promote conservation of the penguins and the marine environment.

3. Use the “service country” (Servicio País, Chile) program to include marine conservation and protecting penguin populations.

4. Work to educate legislators on the conservation of the penguins and the marine environment. These legislators may then be used to help enforce the current laws.

FISHERIES AND FOOD
CROSS-SPECIES WORKING GROUP

Participants: Rob Crawford, Esteban Frere, Gene Fowler, Alejandro Simeone, Antje Steinfurth (plus Patricia Majluf, Heather Urquhart, Hernan Vargas, Carlos Zavalaga)

CRITICAL ISSUES WITH RESPECT TO FISHERIES

LEGAL FISHERIES

1. FOOD RESOURCES

Fishing sub-issues

- reproductive success (breeding proportion, laying frequency, nesting success, age at first breeding)
- immature survival (all 4 species)
- recruitment to breeding populations (African)
- adult survival (in extreme cases for Galápagos, Humboldt)

Action Items:

1. Ensure adequate escapement of forage fish (item should be included in MOU's).
   African Penguins Responsible: Rob Crawford
   Humboldt Penguins Responsible: Roberto Schlatter and Patricia Majluf

2. Reduce bycatch of food fish for Magellanic penguins
   Responsible: Esteban Frere, Patricia Gandini

3. Maintain reproductive stock of mullets (Galápagos), i.e., avoid recruitment overfishing
   Responsible: Hernan Vargas, Fundación Charles Darwin.

4. Measure adult and immature survival (of penguins) in good and bad food Years.
   Responsible: All researchers need to publicize results of ongoing studies.

<u>Climate change sub-issue</u> (pertains to all species)

Action Items:

1. Build models of populations (especially Galápagos and Humboldt). From models, assess the need to artificially feed chicks that would otherwise die (during periodic food shortages – same as above). In other words, will populations continue to decrease in the absence of this intervention, given the periodic loss of immature birds in periods when food is scarce?
   Responsible: Hernan Vargas, Bob Lacy – Rob Crawford will help if needed.

2. Request captive facilities to study ways to "de-imprint" hand-fed birds that are released to the wild because those released during the *Treasure* oil spill came back to humans to be fed.
   Responsible: Heather Urquhart, New England Aquarium

3. If chick-feeding is used, monitor its success by banding and long-term observations to assess subsequent recruitment to breeding populations.
   (Not all participants agreed that banding is worth the risk an suggested that another, more harmless method should be developed.)
   Responsible: Carlos Zavalaga

4. Continue to investigate the use of artificial nest sites (e.g., for rain in Chile, thermal cover in Galápagos)
   Responsible: Rosana Paredes (Perú), Hernan Vargas (Galápagos)

5. Temporary relocate/evacuate animals under extreme conditions (e.g., oil-related translocations of African penguins). This should be included in MOU's.

<u>Competition with other wild species sub-issue</u> (e.g., seals, sea lions)
This is particularly a problem for African penguins in Namibia.

Action Item:

1. Assess this problem using simple multi-species models.
   Responsible: Rob Crawford, Lynne Shannon, Jean-Paul Roux

2. INCIDENTAL CAPTURE

<u>Gill Net Capture sub-issue</u> (pertains to all 4 species (if Galápagos fishery continues to expand).

Action Items:

1. No gill nets should be allowed near breeding colonies (This item should be included in MOU's.)
   Responsible: Rob Crawford for African Penguin
   Roberto Schlatter & Patricia Majluf for Humboldt Penguin

2. Provide incentives, mechanisms for artesanal fishermen to benefit from alternative uses of penguins (e.g., ecotourism) so that they have reason to protect penguins.
   Responsible: Leonardo Nuñez

3. Request fisheries services to monitor beaches for stranded/entangled penguins and for gill net capture (see page 16).
   (SERNAP, IMPARPE).
   Responsible: Alejandro Simeone, Patricia Majluf.

4. Create international pressure on governments and institutions to provide monitoring.
   Responsible: John Cooper, Susie Ellis, IUCN

5. Investigate mitigation measures for reducing incidental catch of penguins.
   Responsible: Patricia Majluf

6. Investigate overlap between foraging and fishing and transit areas.
   Responsible: Patricia Majluf

<u>Shrimp Trawls sub-issue</u>

This affects Magellanic penguins mid-water in southern Argentina. Gandini et al. (1999) have estimated 0.7% take of local population per year.

Action Items:

1. Need on-board observer program to monitor and control, exists for shrimp take and bycatch, needs to include data gathering for penguin and other seabird incidental take.
   Responsible: Esteban Frere, Patricia Gandini

2. Determine methods to improve fishing gear to reduce take of penguins.
   Responsible: Esteban Frere, Patricia Gandini

<u>Deliberate take sub-issue</u> (bait or food) (pertains to Humboldt penguins in Perú and Chile)

Action Items:

1. Educate fishermen.
   Responsible: Alejandro Simeone, Esteban Frere, Patricia Gandini

2. Determine economic incentives to deter using penguins as bait or food (e.g., ecotourism).
   Responsible: Alejandro Simeone, Esteban Frere, Patricia Gandini

3. ILLEGAL FISHERIES

Illegal fisheries usually act through the same mechanisms as legal fisheries, but there are two problems:

1. The magnitude of take is not known.
2. The magnitude of the take is very difficult to estimate, but it may be possible to control, theoretically.

Action Item:

1. Publicize the magnitude of this problem in order to pressure governments to enforce laws and regulations.
   Responsible: All participants

MONITORING PENGUINS
CROSS-SPECIES WORKING GROUP

Participants: Braulio Araya, Mario Leshoro, Gina Mori, Milena Roca, Phil Whittington, Anton Wolfaardt

Main aim

To improve understanding so that we can better manage penguin populations and improve their conservation status.

1. Monitoring is essential to determine/establish the result of actions (management, conservation, development, etc.). Data collection is an essential tool in the formation of policy and subsequent legislation.

2. Define and prioritize issues to be monitored. What parameters need to be assessed?

3. Design a standardized set of protocols in a handbook (e.g., as in CCAMLR handbook). This could be for a species, country, or locality (such a guide exists for Punta San Juan). Would a general guide covering all species/ countries be useful? This helps to ensure consistent, comparable data collection over long term periods.

4. Guidelines should be refined for species/localities. The guidelines must contain sufficient information for inexperienced personnel to follow. A handbook should contain basic information about the species and other aspects being monitored. Must also contain aims for different monitoring strategies.

Types of monitoring

1. Regular censuses to obtain estimates or an index of population size and trends.

2. Assess breeding population and proportion of population that is breeding. Monitor proportion of different nest sites where relevant.

3. Determine effects of human disturbance (e.g., tourism, research) on population size and productivity.

4. Establish survival/mortality factors for different age classes (e.g., 1st year vs. adult). Try to assess reasons for mortality.

5. Monitor number of oiled/entangled birds present in populations.

6. Monitor the effects of pollution incidents, e.g., follow up of rehabilitated birds from oil spills.

7. Monitor timing of aspects of life cycle (e.g., peak egg laying period, molt period etc). These data can be used when trying to minimize the impact of certain activities on the birds.

8. Monitor distribution of birds within colony. Show contraction or expansion of range. May have conservation implications.

General

1. Encourage local communities to assist/carry out monitoring work. Perhaps this could be done initially on a volunteer basis, with supervision.

2. Co-ordinate and synchronize monitoring efforts between range states (e.g., for a global census).

3. Monitor the populations and distribution of potential competitor species (e.g., seals, sea lions, other birds) and of prey species populations.

4. Monitor other related factors (e.g., tonnage/number of ships passing coastline, number of visitors to nature reserves/penguin colonies, weather parameters).

5. It would be desirable to monitor distribution and movements of penguins at sea, but this may not be possible on a continuous basis and fall under the auspices of research.

6. Disseminate/publish results of monitoring work.

Priority Action Items

1. Handbook(s) of protocols for monitoring of penguins.

2. Dissemination/availability of results from monitoring exercises.

The issues raised in this group are wide-ranging and apply to all interested and affected parties. It is therefore difficult to assign tasks to particular people. However, as a start, the following four people would be prepared to initiate the recommendations: Gina Mori, Milena Roca, Phil Whittington and Anton Wolfaardt.

RESEARCH/ CLIMATE/ INCREASING REPRODUCTIVE SUCCESS CROSS-SPECIES WORKING GROUP

Desired Outcomes List

- We need to know the number of Humboldt penguins after El Niño.
- Increased effort and research on Galápagos penguins.
- What is happening at sea?
- What are patterns of dispersal?
- Increased emphasis on disease.
- Better understanding of conservation issues.
- Nest conditions—what makes a good nest?
- Distribution and abundance of penguins in southern Chile.

Long term research is essential to providing the information we need in order to identify and address the conservation of these species. Long-term programs that are ongoing must be continued and new programs need to be initiated for those species or major populations for which there are not currently underway.

Long Term Research Goals

1. Basic breeding biology
   - Effect of age structure on population
   - Factors that affect breeding success

2. Habitat value: components of terrestrial and marine habitats that are important to the population and population processes.
   - Nest site characteristics: parameters that make a good nest, a good colony; design of artificial nests to enhance reproductive success.
   - Identification of marine "habitats" used by penguins and their seasonal, annual, or periodic use.

3. Foraging biology
   Catch per unit effort for penguins is a way of connecting the quality of marine environment to reproductive success and using the information for management decisions (e.g., determining which subpopulations are thriving/ failing, determining which sites would provide greatest value for enhancing nest sites or colonizing new sites, areas where protection is needed, etc.)

Species-Specific Research Needs

Humboldt penguins

- Distribution at sea during key times, e.g., juvenile stage, pre-molt, non-breeding periods, adults during chick rearing.
  Responsible: Alejandro Simeone, Patricia Majluf, Rory Wilson, Janos Hennicke.
  Long term

- Determining characteristics of natural nests and how to improve nest sites.
  Responsible: Rosana Paredes, Mary Jo Willis, Guillermo Luna *Short and long term*

- Determine catch-per-unit effort for penguins as a way to connect the marine environment to reproductive success.
  Responsible: Janos Hennicke, Alejandro Simeone. *Long term*

- Quantify the risk of entanglement based on pattern of penguin use of the environment (penguin "highways," diving and swimming characteristics, areas of use during breeding and non-breeding seasons, patterns of use of fishing gear…); quantify entanglement at key sites.
  Responsible: Patty McGill to coordinate with Patricia Majluf, Mariano Bernal and Alejandro Simeone. *Short and long term*

- What allows juveniles to recruit (dispersal, areas at sea, body condition…).
  Responsible: Rosana Paredes, Carlos Zavalaga, Milwaukee Zoo team *Long term*

Galápagos penguins

- What makes a good nest? Can artificial nests improve reproductive success?
  Responsible: Hernan Vargas. *Short and long term*

- Research on introduced predators.
  (Hernan Vargas, Dee Boersma) *Short and long term*

- Research on pathogens, especially introduced or emerging disease, parasites, etc.
  Responsible: Hernan Vargas, Nigella Hillgarth *Short and long term*

- Research on catch-per-unit-effort (CPUE).
  Responsible: Rory Wilson, Hernan Vargas. *Long term*

- What allows juveniles to recruit (dispersal, areas at sea, body condition…).
  Responsible: Hernan Vargas, Dee Boersma. *Long term*

African penguins

- Information on catch-per-unit-effort (CPUE).
  Responsible: Rory Wilson, Rob Crawford, Peter Ryan. *Long term*

- Nest site characteristics and how to design artificial nests.
  Responsible: Anton Wolfaardt. *Short and long term*

- Effective (socially acceptable) mitigation of seal and cat predation on penguins.
  Responsible: Anton Wolfaardt (cats), Tony Williams, Heather Urquhart (seals).
  Short and long term

- What allows juveniles to recruit (dispersal, areas at sea, body condition…).
  Responsible: Rob Crawford. *Long term*

- Using information from CPUE and other aspects of site quality to determine advisability and feasibility of establishing new colonies.
  Responsible: Rob Crawford, Tony Williams. *Short and long term*

Magellanic penguins

- How important is oil contamination to penguin populations?
  Participants: Esteban Frere, Patricia Gandini, Dee Boersma. *Short and long term*

- CPUE information.
  Responsible: Dee Boersma, Rory Wilson. *Long term*

- Identify important sites of at-sea distribution, especially during pre-molt.
  Responsible: Dee Boersma, Rory Wilson. *Long term*

- What allows juveniles to recruit (dispersal, areas at sea, body condition…).
  Responsible: Dee Boersma. *Long term*

General Research Items

Rory Wilson will assemble information on methods for conducting CPUE studies and will distribute information to colleagues working with different species at various sites. He also will assist with assessment of methods that are appropriate for different sites, as needed. Additionally, he will assist in finding references on weighbridge technology.

PROTECTION
CROSS-SPECIES WORKING GROUP

Participants: Mariano Bernal, Cynthia Cheney, Tom Keating, Patricia Majluf, Leonardo Núñez, Roberto Schlatter, Roberta Wallace

International

1. **Create a quick response network to respond to pollution and other environmental disasters anywhere in the world. This network would mobilize volunteers and resources to the disaster area and should identify the needs and risks and develop contingency plans and response protocols.**
2. Develop MOUs to be submitted to the Bonn Convention to include the African penguin into the Convention on Migratory Species.
3. Bring VORTEX models up to date, including the new information on breeding success, census, etc. and use this information to produce a report to be sanctioned by the Spheniscid group and submitted to IUCN as the basis for our request to upgrade the Humboldt Penguin category from Vulnerable to Endangered.
4. We recommend international exchange about protection/information between penguin experts and those with previous experience in this through workshops, web pages, magazines, etc.
5. Increase support to *Penguin Conservation* as an important means of disseminating information, trying to expand its scope to cover fisheries or other international legislation relating to penguins, listing national or international resources or agencies that exist.
6. Develop a geographic database identifying potential risk areas, relating transit routes of tankers and other transport ships, pollution sources, tourism developments to penguin colony distribution.
7. Re-emphasize and enforce the United Nation's International ban on the use of gillnets.

Regional

1. **Develop bi-national agreements to manage industrial fisheries on a regional basis (e.g., Perú-Chile, Namibia-South Africa, Argentina-Chile)**

2. Increase communication between interdisciplinary groups working on a species that ranges in several countries to update and exchange information on a regular basis, through regional species specific workshops, web pages, electronic bulletin boards/lists, etc.
3. Study penguin movements at sea to identify migration routes across borders and use this information as the basis for the establishment of a system of Marine Protected Areas that covers the range of the species.

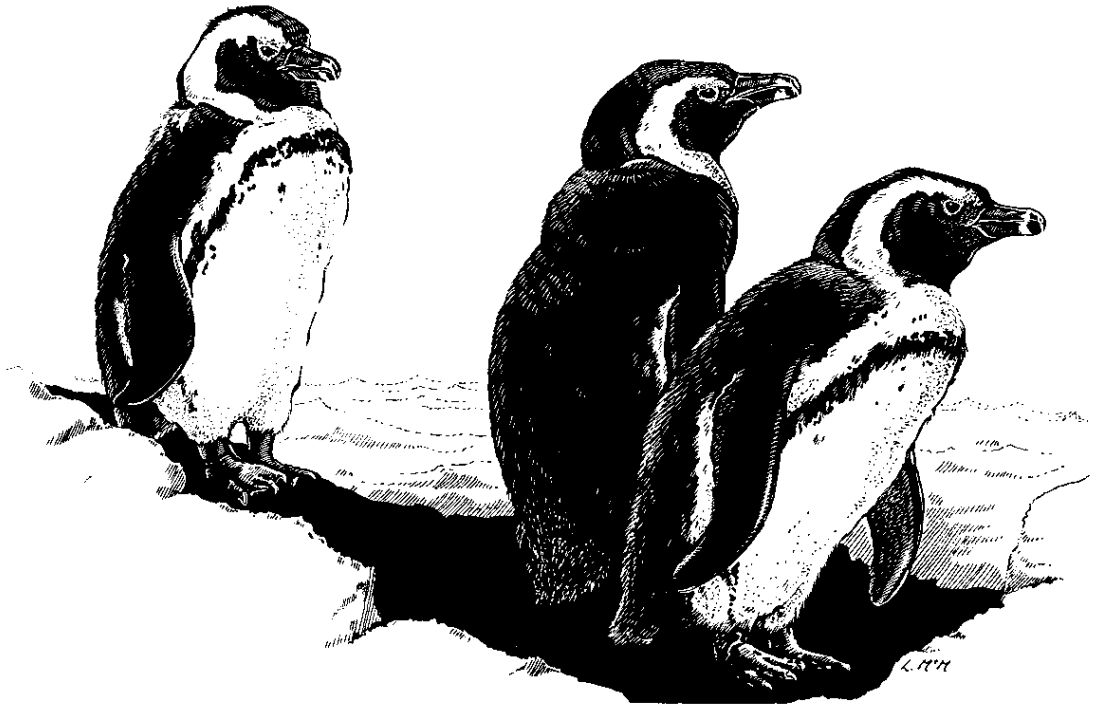
Local

1. **Work with local governments to implement Marine Protected Area (MPA) systems covering the main penguin rookeries, penguin prey species and their foraging ranges. MPAs should regulate transit and other activities around rookeries, including fisheries and recreational activities.**
2. Further studies of the distribution, abundance and movements of penguin populations are needed to prioritize areas to establish Marine Protected areas.
3. Work with local legislators to develop in-country laws to regulate or ban the use of gillnets around penguin rookeries or transit routes.
4. Develop and obtain support for local agencies enforcing anti-poaching laws.
5. Identify high-risk pollution sources affecting penguins and creating and enacting legislation to decrease the risks of pollution.
6. To establish guidelines to control ecotourism access and timing of visits to penguin rookeries. (e.g. Otway Foundation, contact: Horst George)

SPHENISCUS PENGUIN CONSERVATION WORKSHOP

9-10 September 2000
Universidad Católica del Norte, Coquimbo, Chile

FINAL REPORT



Section 3

Appendices

Appendix I.
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Appendix II.
Endorsement of the Development of Memoranda of Understanding between Chile and Perú for the Humboldt Penguin Under the Terms of The Convention on the Conservation of Migratory Species of Wild Animals

RECOGNIZING that both the Humboldt penguin is listed as Vulnerable on the IUCN Red List of Threatened Species and in Appendix I of the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention);

RECALLING that the Sixth Conference of the Parties of the Bonn Convention passed resolutions calling for inter-sessional collaborative action by range states to improve the conservation status of the species;

NOTING that there are only two important breeding range states, Chile and Perú, for the Humboldt penguin and that this species migrates between these countries;

AWARE that Humboldt penguins has been the subject of IUCN Conservation Breeding Specialist Group-led workshops, in collaboration with local scientists and managers, which recently produced guidelines for its conservation;

CONCERNED that the Humboldt penguin populations have declined approximately 35% in 15 years and that current reproductive rates are not sufficient to maintain long-term population viability under continued high fledgling mortality, adult mortality due to entanglement in nets as well as overall mortality, particularly during severe El Niño Southern Oscillation years, even if mortality attributed to harvest by humans is reduced to 1 percent per year;

CONVINCED that the conservation and effective management of this migratory species will require the concerted action of all States within the national jurisdictional boundaries in which it spends significant portions of its life cycle;

CONVINCED that collaborative actions by these range states in terms of implementing monitoring and research, emergency contingency planning, eco-tourism regulation, establishment of marine protected areas and reduction of fishery-induced mortality could significantly and positively decrease the risk of extinction facing this species, as noted in recommendations for conservation and management developed by the specialists from nine countries present at the *Spheniscus* Penguin Conservation Workshop held in Coquimbo, Chile in September 2000;

THE PARTICIPANTS OF THE *SPHENISCUS* PENGUIN CONSERVATION WORKSHOP THEREFORE ENDORSE AND ENCOURAGE THE ADOPTION OF A MEMORANDUM OF UNDERSTANDING BETWEEN CHILE AND PERÚ FOR THE HUMBOLDT PENGUIN AS A MEANS OF ENHANCING THE PROTECTION AND CONSERVATION OF THIS MIGRATORY SPECIES.

Appendix III.
Endorsement of the Development of Memoranda of Understanding between Namibia and South Africa for the African Penguin Under the Terms of The Convention on the Conservation of Migratory Species of Wild Animals

RECOGNIZING that the African penguin is listed as Vulnerable on the IUCN Red List of Threatened Species and in Appendix II of the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention);

RECALLING that the Sixth Conference of the Parties of the Bonn Convention passed resolutions calling for inter-sessional collaborative action by range states to improve the conservation status of the species;

NOTING that there are only two important breeding range states, Namibia and South Africa, for the African penguin and that this species migrates between these countries;

AWARE that the African penguin has been the subject of IUCN Conservation Breeding Specialist Group-led workshops, in collaboration with local scientists and managers, which recently produced guidelines for its conservation;

CONCERNED that African penguin populations have declined by 40,000 adults in the past 15 years (averaging 1.5 percent decline per year), and that these populations have suffered significant losses from recent oiling events;

CONVINCED that the conservation and effective management of this migratory species will require the concerted action of all States within the national jurisdictional boundaries in which it spends significant portions of its life cycle;

CONVINCED that collaborative actions by these range states in terms of implementing monitoring and research, emergency contingency planning, eco-tourism regulation, establishment of marine protected areas and reduction of fishery-induced mortality could significantly and positively decrease the risk of extinction facing African penguins, as noted in recommendations for conservation and management developed by the specialists representing nine countries at the *Spheniscus* Penguin Conservation Workshop held in Coquimbo, Chile in September 2000;

THE PARTICIPANTS OF THE *SPHENISCUS* PENGUIN CONSERVATION WORKSHOP THEREFORE ENDORSE AND ENCOURAGE THE ADOPTION OF A MEMORANDUM OF UNDERSTANDING BETWEEN NAMIBIA AND SOUTH AFRICA AS A MEANS OF ENHANCING THE PROTECTION AND CONSERVATION OF THIS MIGRATORY SPECIES.

Appendix IV.
Glossary of Acronyms

Acronym	Country	description in English	la descripción en español
SERNAP	Chile	Chilean National Fishery Service	Servicio Nacional de Pesca
IMPARPE	Perú	Institute of the Sea of Perú	Instituto del Mar del Perú
CONAMA	Chile	National commission of the Environment	Comisión Nacional del Medio Ambiente
CONAF	Chile	The Chilean National Forest Service	El Servicio Forestal de Chile
SANCCOB	South Africa	The Southern African Foundation for the Conservation of Coastal Birds	
CCAMLR	Antarctica	Commission for the Conservation of Antarctic Marine Living Resources	
PROABONOS	Perú	Special Project of Promotion of the Advantage of Guarantees originating from Marine Birds	Proyecto Especial de Promoción del Aprovechamiento de Abonos Provenientes de Aves Marinas
CEDENMA	Ecuador	Ecuadorian Committee for the Defense of Nature and the Environment	el Comité Ecuatoriano para la Defensa de la Naturaleza y el Medio Ambiente