

BirdLife International/American Bird Conservancy

Workshop on Seabirds and Seabird-Fishery Interactions in Peru

25-27 June 2007 Lima, Peru



In collaboration with:



OBJECTIVE

For BirdLife International, its Americas regional office and its Global Seabird Programme, in conjunction with the American Bird Conservancy seabird program, to bring together the main individuals and organisations working on seabird-related topics in Peru in order to develop a coordinated plan of action in relation to seabird conservation and management priorities in the Peruvian EEZ and adjacent waters.

PARTICIPANTS, PROCESS, PAPERS

Attendees

See list at Annex 1.

Agenda

See original agenda and simplified working agenda at Annex 2.

Documents

The list of documents available at the meeting is at Annex 3.

Recommended citation

BirdLife International 2008. BirdLife International/American Bird Conservancy Workshop on Seabirds and Seabird-Fishery Interactions in Peru. RSPB, Sandy, UK.

REPORT OF MEETING

1 Issues Arising from Interactions with Longline Fisheries

1.1 Waved Albatross *Phoebastria irrorata* (CR)

In addition to the relevant papers from Annex 3, participants had available for discussion the draft Action Plan for Waved Albatross (version of 4 June 2007) prepared for the ACAP Workshop and the version of the "Implementation of the Plan of Action for Galapagos Albatross in Ecuador" that was updated during that workshop.

1.1.1 Ecuador

It was recognised that the new Ecuadorian plan is extremely comprehensive and will require careful consideration of priorities, including in relation to importance and feasibility. It already forms a good basis for relevant elements of the planned ACAP Workshop in Ecuador (likely to be held in early 2008). Aves y Conservacion were recommended to work with the report's co-authors to further develop the plan in readiness for the workshop.

Particular priorities raised at the present Workshop were:

- 1 Carrying out whole-island surveys of the breeding population in each of the next 3 years and defining feasible areas, timings and methods as necessary for repeating this at appropriate intervals in future.
- 2 Identifying a network of smaller sites/areas for annual monitoring of population size and productivity that are representative of the overall population and will permit cost-effective monitoring in between future whole-island surveys.
- 3 Consider the feasibility/cost-effectiveness of establishing a second site for demographic studies (to complement the existing study).
- 4 In addition, new consideration appeared necessary in relation to:
 - (a) reducing habitat deterioration in Waved Albatross breeding areas;
 - (b) preventing bycatch of albatrosses in any fishery operating within the Galapagos marine park.
- 5 Additional tracking data on at-sea distributions are required to assess the degree of inter-annual variation for breeding birds and to provide range data for non-breeding and juvenile birds. Comparative analysis of relevant remote recording and at-sea survey data is also needed.
- 6 Review and prioritisation of actions in the management plan for Isla La Plata is also highly desirable.

1.1.2 Peru

The limitations of existing data from Peru on known and/or potential levels and rates of fisheries-related seabird mortality and the difficulty of obtaining more reliable data in such situations were recognised. This Workshop recognised as high priorities:

1 For artisanal longline fisheries:

collaboration, as feasible, between existing groups/individuals researching bycatch rates of non-target species (especially seabirds, sea turtles, marine mammals) in order to develop:

- (a) collection of data/information on bycatch levels/rates in as systematic, widespread and repeatable a manner as possible.

However, it was noted that, despite limitations, observations on more than 1.22 million hooks in the region have failed to report any waved albatross mortality in the artisanal longliners from Peru or Ecuador, operating within (and beyond) the core range of the Waved Albatross. The reasons for this may be related to boat structure (very low decks, frequent use of manual, side-setting techniques, that reduce the time the bait is available), or with operational modes (beginning sets in the dark, use of fresh bait, few discards, little offal production, etc.) than with mitigation efforts. Whether Waved Albatrosses regularly follow these boats is uncertain but they are known closely to approach boats to feed on discarded offal; Black-browed Albatross *Thalassarche melanophris* and White-chinned Petrel *Procellaria aequinoctialis* have been documented as caught as longline bycatch in Peruvian waters. Most information, therefore, suggests that, unless the existing data are not representative, albatross bycatch rates in these fisheries are very low. Nevertheless, total fishing effort is high, so even low and patchy (in space and time) bycatch rates could be of concern.

- (b) development of education programmes, especially in relation to mitigation techniques (with appropriate training where feasible), when the need for mitigation is demonstrated.

2 For commercial longline fisheries:

- (a) develop assistance for IMARPE in training/development (and expansion as appropriate) in relation to observation of bycatch in its fishery observer programme. In addition, reliable identification sheets are required to distinguish at-risk seabirds, especially the local albatross species.

- (b) provide assistance to IMARPE in identification and deployment of appropriate mitigation measures to minimise bycatch.

It was noted that a similar requirement was emphasised by Peru at the recent ACAP Advisory Committee meeting (draft Report para 12.1.9), where: "Peru underscored the urgency to have an onboard observer programme with a national agency as its coordinator. ... This observer programme should have standardized protocols for by-catch assessment and a sampling coverage which is representative of the fleet."

In relation to several issues raised in this section, a subgroup, comprising participants from IMARPE, APECO and Pro Delphinus, developed suggestions for facilitating co-ordinated work (Annex 4).

3 For high seas fisheries (i.e. in the IATTC area):

- (a) further investigation of the overlap in space and time between the at-sea range of Waved Albatross and fishing effort by tuna longliners, particularly to assess inter-annual variation and key foraging areas of non-breeding and juvenile individuals;

- (b) increase observer effort on vessels in the area to assess the nature and magnitude of bycatch interactions with seabirds. Work with national delegations of countries involved, in the framework of IATTC, to achieve that goal.

It was noted that other priorities are likely to arise from further discussion of the next draft of the Waved Albatross Action Plan.

1.1.3 General

1 Range Data:

Further data on the distribution of at-risk seabirds in relation to the distribution of relevant artisanal and commercial fisheries are needed. Within the Peruvian EEZ, enhancement of existing IMARPE surveys was recommended, in conjunction with further targeted remote-recording instrumentation of appropriate seabird species, notably Waved Albatross (from Galapagos) and Chatham Albatross (from New Zealand) (see also section 4 below)

2 Direct Takes:

The only documented source of mortality for Waved Albatrosses was directed takes for human consumption. Even though these takes happened from gillnet boats (using individual baited hooks), nothing precludes the taking of birds in the same manner from other fishing boats (and some bands have been reported by longline fishers). This take is unlikely to relate directly to the fishing operations, and therefore it may best be treated as a specific issue, independent of incidental mortality.

It was agreed that priority actions should include development of education programmes in the communities involved in this practice (apparently Salaverry, Chimbote, and a few smaller ports). This issue is particularly difficult and will require a very carefully conceived and implemented plan, developed in conjunction with all stakeholders to begin to address it. In this regard, the whole fishing community should be the target for the actions, with gillnet (and longline) fishers probably being the most important sectors. It will also be important to learn whether the albatrosses are actually attracted to the gillnet and longline vessels, or whether they simply share the habitat with the participants in this fishery.

2 Other Topics Relating to Fisheries Bycatch

2.1 Gillnet Fisheries

Species traditionally particularly affected are penguins and cormorants/shags. This is also the case in Peru, notably for Humboldt Penguin *Spheniscus humboldtii*, Guanay and Red-legged Cormorants *Phalacrocorax bougainvillii* and *P. gaimardi* but also for boobies. Nowadays, however, at least for penguins, the issue appears mainly confined to northern Peru waters.

Nevertheless, a review of Peruvian fisheries in terms of fishing type/gear, areas and overlap with at-risk species, would be very useful to focus attention on potential problem areas.

2.2 FAO National Plan of Action- Seabirds

Before commencing an NPOA-Seabirds for Peru, it was recommended that relevant Peruvian specialists obtain invitations to attend the forthcoming (2008) FAO Technical Consultation Meeting which will enhance existing IPOA-Seabirds for longline fisheries and develop guidelines for trawl fisheries. For further details on the planning for this meeting, contact ben.sullivan@rspb.org.uk.

3 Seabird Distribution, Status and Important Bird Areas (IBAs)

The Workshop reviewed the status and distribution of Peruvian seabirds, notably as candidates for review of IUCN Red List status (in time for the 2008 review, evaluations for which need completing by the end of 2007) and in relation to the identification of breeding sites as candidate IBAs (in time for the production of the BirdLife Americas IBA volume in 2008).

3.1 Humboldt Penguin *Spheniscus humboldtii* (VU)

This species has been relatively comprehensively studied and much of the population, especially in Peru, surveyed fairly regularly with recent results (for 1999-2000) published. These and other data were reviewed at the meeting and by a specialist subgroup (see Annex 5). Based on this, the Workshop made the following main comments and recommendations:

3.1.1 Status in Peru

The conservation status of Humboldt Penguin in Peru remains a serious concern. The total Peruvian population is unlikely to exceed 5,000 individuals with c.3,000 of these in the central southern zone, where most of the main breeding colonies occur. The principal threats are still bycatch mortality in fishing gear and illegal capture for human consumption and for the pet trade. Disturbance of breeding sites and reduction/deterioration in breeding habitat (mainly through guano extraction) and increasing potential competition with artisanal (and commercial) fisheries for anchoveta are additional threats.

3.1.2 Trends in Peru

Assessing the population trend of Humboldt Penguins in Peru is still difficult, despite extensive survey work. This is partly because of variation in the timing and duration of breeding, and partly because many colonies are in sea caves, where observation of breeding individuals is particularly difficult. This has led to surveys being focused on the moult period. However, the movements of birds between breeding and moult make relating numbers counted to specific breeding sites difficult; problems in distinguishing adults and immatures may also affect the use of data from the moult period. There was general recognition of the need to ensure the use of the most appropriate method for each site (especially for the key sites most suitable for regular monitoring), where possible involving both moult and breeding counts and to apply these methods consistently in successive surveys.

Accordingly, it was recommended that:

- (a) all important breeding sites be assessed in relation to:
 - (i) optimum survey methods and timing;
 - (ii) feasibility of obtaining consistent data for reliable estimation of future population trends;
- (b) for the central southern zone, analysis of relevant data from Punta San Juan should identify the appropriate time windows and correction factors (to estimate total nests/breeding pairs) for such surveys at analogous sites;
- (c) for sites in the north (e.g. Isla Foca) and south (e.g. Punta Coles), pilot studies to assess optimum survey timings would likely be needed;
- (d) a comprehensive plan for future surveys of the Peruvian population, incorporating periodic complete censuses with annual monitoring of key representative colonies should be developed;
- (e) all available baseline site-specific population data on breeding and moult counts should be assembled into a single database, jointly coordinated by or on behalf of the principal research groups involved and available, under appropriate safeguards and rules of data access and use, to other interested parties.

3.1.3 Overall Status and Trends

The overall status of Humboldt Penguin currently depends critically on knowledge of the Chilean population. Few data for this are publicly available and the results and methods of any (including recent) surveys are uncertain.

It is a high priority to:

- (a) review Chilean data for this species;
- (b) develop survey methodologies/frequencies consistent with those in Peru;
- (c) review the overall conservation status of the species. It was noted that an excellent opportunity to commence this process would be for appropriate researchers attending the International Penguin Conference in Hobart in September 2007 to meet to discuss this.

3.1.4 Important Bird Areas

As candidate IBAs in respect of their populations of Humboldt Penguin in Peru, 22 sites were proposed (see Annex 5). For five of these sites, breeding needs to be confirmed.

3.1.5 Site Protection in Peru

Of the 22 proposed candidate IBAs, six are in the Paracas National Reserve protected area (albeit some of the threats indicated earlier still apply in this area), six others are in guano reserves (thereby enjoying protection from some threats through the presence of resident wardens), whereas the remainder entirely lack breeding site protection. This is a priority topic for attention, initially through assessment of the threats at the unprotected sites and the means by which these could be minimised. Management plans for Paracas and the guano islands need to take explicit account of the Globally Threatened status of Humboldt Penguin and the importance of protecting it accordingly.

3.1.6 Education Programmes

Environmental (and legal, i.e. the level of fines for illegal capture) education programmes are needed for the general public (adults and children), especially in artisanal fishing ports near candidate IBAs.

3.1.7 Management of Fishing Activity

Plans for managing fishing activity within the foraging ranges (known or protected) of breeding birds from all main penguin breeding colonies are needed, both to address potential issues with gillnets (e.g. mitigation research) and interactions with the anchoveta fishery.

3.2 Peruvian Diving Petrel *Pelecanoides garnoti* (EN)

In Peru, this species is essentially restricted to the islands of La Vieja and San Gallan, on the central coast of Peru, where Jahncke and Goya (1998) estimated the population to be 13,000 pairs. More recently, a third (small) breeding site has been discovered at Corcovado Island (Valverde 2006). Guano harvesting and direct depredation by poachers were recognised as primary threats. There are also suggestions that the presence of mice may be an issue. A sub-group reviewed the situation for this species (see Annex 6) and on this basis the Workshop made the following comments and recommendations:

- 1 Further surveys are needed to try to discover additional breeding sites (Guanape Sur Island is a particular priority).
- 2 A species management/action plan for the existing breeding sites is urgently needed, together with an assessment of the implementation priorities for e.g. eradication of aliens, restoration of habitat, minimising/preventing disturbance and deliberate take.
- 3 Identification of feeding range/areas is needed.
- 4 Consideration should be given to assessing the potential for translocation to other appropriate sites and for a restoration programme to enhance the population at existing sites (e.g. Corcovado).

- 5 All confirmed breeding sites of this species (in both Peru and Chile) should automatically become candidate IBAs.
- 6 Reevaluation of the species' status/distribution in Chile is highly desirable.

3.3 Peruvian Tern *Sterna lorata* (EN)

Carlos Zavalaga and Manuel Plenge presented information from their forthcoming paper on the status and distribution of this species, which formed the basis for subgroup discussion (see Annex 7), on the basis of which the recommendations below were developed by the Workshop. Even historically, this is a poorly known species with widely and patchily distributed breeding colonies of very small numbers of individuals scattered over large and often remote areas. In Peru, it may breed nowadays at no more than 3 of about 7 currently known sites, each holding in the region of 12-70 individuals per site and with a total Peruvian population that might not exceed 1,000 individuals. However, there is much potential for collecting data and undertaking surveys to locate other sites. Nevertheless, the propensity for disturbance and habitat destruction and deterioration at known sites is such that re-evaluation of the Red List status of this species is recommended.

- 1 An urgent priority is to protect the breeding area (the largest known single site) within the Paracas reserve from disturbance by tourists, vehicles, etc. Protection for this species needs incorporating into the Paracas Management Plan as one of its highest priorities, considering the Globally Threatened status of this species and that about 66-68% of the world population occurs in Peru.
- 2 Surveys to confirm breeding at current sites, to assess the status of sites with historical breeding records and to prospect for new sites in potentially suitable habitat, are needed (see list of potential sites in Annex 7).
- 3 Reassessment of the IUCN Red List conservation status (see preliminary advice on upgrade to Critically Endangered in Annex 7) will require access to information from the forthcoming Zavalaga and Plenge paper. They were requested to make this available to the assessors at the BirdLife Secretariat (via the Seabird Coordinator ben.sullivan@rspb.org.uk).
- 4 All known breeding sites for this species (in both Peru and Chile) should automatically qualify as candidate IBAs. Note that the Chilean population is estimated to total about 90 nests (perhaps 350 individuals) at 8 sites (Guerra 2003).

3.4 Red-legged Cormorant *Phalacrocorax gaimardi* (NT)

The breeding population of Red Legged Cormorant appears much lower than was thought (or estimated during the 1980s). Human coastal harvesting and recent El Nino Southern Oscillation (ENSO) events had important effects on abundance and distribution, particularly in Peru (Zavalaga et al 2002). Along the Peruvian coast, about 1800 adults were counted during 2000, two years after the ENSO of 1997-98. Recent published data on the distribution and abundance of this species (Zavalaga et al 2002 for Peru, Frere et al 2004 for Chile and Frere et al 2005 for Argentina) have enabled the first reliable global estimate of breeding population (about 14,000 breeding adults) to be made. Chile holds the bulk of the world population (70%) and most of the large (candidate IBA) colonies. If population trends in Chile were analogous to those in Argentina (where substantial declines have occurred in recent years) the species might well qualify as Vulnerable.

Re-evaluation of its global conservation status is needed. In addition:

- ⇒ A new survey at key sites along the Peruvian coast is needed, particularly at: Isla Lobos de Tierra, Paracas National Reserve, Punta Lomitas, Punta San Juan, Punta Lomas, Punta Atico, La Chira and Punta Islay.
- ⇒ A better understanding of the effect of the ENSO on Red-legged Cormorant populations is needed: After the next ENSO event censuses at key localities are critical.

Based on the new estimates of global population, the 1% qualifying level for IBA status (as a Near Threatened species) would be about 140 individuals. Most breeding sites in Peru are small and probably none would qualify as candidate IBAs on the basis of the criterion. Nevertheless, in Peru it breeds in a considerable number of candidate IBAs derived from criteria for other species/assemblages.

In Chile, from the data presented in Frere et al (2004), the following sites would qualify as candidate IBAs, based solely on the presence of breeding Red-legged Cormorant:

Bahía Quintero (21° 20'S), Bahía Mejillones (23° 06'S), Peñon Cabras-Isla Chicaumilla (33° 12' – 33° 15'S), Isla Mocha (38° 22'S), Punta Ronca (39° 23'S), Isla y costa Maiquillahue (39° 27'S), Pilolcura (39° 40'S), Colonia Curiñanco (39° 41'S), Cerro Amortajado (41° 39'S), Islotes Farallones (41° 41'S), Peninsula Chocoy (41°45'S), Isla Doña Sebastiana (41° 46'S), Punta Corona (41° 47'S), Punta Pirulil (42° 44'S), Punta Bonita (42° 46' - 48'S), Punta Chaiguaco (43° 00'S), Punta Elefante (46° 25'S).

3.5 Guano Birds (Guanay Cormorant *Phalacrocorax bougainvillii* (NT), Peruvian Booby *Sula variegata*, Peruvian Pelican *Pelecanus thagus*)/Colonies (Guaneras)

3.5.1

Summaries of population trends in these species, dating back to 1925 were provided by Jordan and Fuentes (1966; for the years 1925-1952), Tovar et al (1987; for 1953-1982) and Goya (2000; for 1953-1999 and 2006). These and more recent information (Goya & Valverde 2006) were reviewed for the workshop by Elisa Goya in the context of the dynamics of the system. In addition to portraying the large-scale historical reduction in numbers (to the current level of around 2 million breeding birds, this overview indicated that Guanays have shown the greatest decline, at least in recent years (and hence their current classification as Near Threatened). Reasons for this are uncertain but may relate to some combination of:

- (a) ENSO-mediated reduction in recruitment, leading to an aging adult population and reduction in breeding frequency and performance;
- (b) greater overlap between anchoveta fishery and Guanay feeding areas and/or post-ENSO recovery of Guanay inhibited by fishing;
- (c) illegal hunting and related human disturbance. (The Workshop heard later that up to 10,000 Guanay may be taken from several of the important breeding sites, particularly in the north of its range (and especially Isla Mazorca).

On this basis, the conservation status of the species might warrant re-evaluation.

3.5.2

The colonies of breeding guano birds (guaneras) are one of the world's most spectacular aggregations of seabirds. Their distribution in Peru is illustrated in Annex 8a. In respect of IBA criteria relating to congregatory species, any site holding more than 10,000 pairs of any of these species is automatically a candidate IBA. No recent published list of estimates of total (or species-specific totals) of breeding birds of each of the guaneras is available. However, the attached figure (Annex 8b) indicates that of 35 sites summarised therein, 18 have populations of more than 100,000 birds. Of the remainder, sites with potentially fewer than 20,000 birds (10,000 pairs) would appear to be Isla Santa, Punta Culebras, Punta Colorado, Punta Salinas, Isla Palominos, Punta Lomas, Punta Pampa Redonda, Punta Islay (8 sites).

Thus 26 guaneras would be candidate IBAs, though these could probably be grouped into some 20 or so functional sites by combining:

- (a) Guanape Norte and Sur;
- (b) Punta Salinas, Isla Huampanu, Isla Mazorca
- (c) Isla Cavinzas and Isla Palominos
- (d) Chinca Norte, Centro and Sur with Islas Ballestas and La Vieja within the Paracas National Park

3.5.3

Protection of candidate IBAs, except for sites within the Paracas National Reserve (enjoying reasonable potential/nominal protection) and Punta San Juan (where the headland is walled off to exclude alien species and minimise human disturbance and the guano harvest is managed sustainably), none of the other guaneras enjoys any statutory protection. However, the presence of resident wardens does restrict illegal access/harvesting/disturbance. Also, the 2 nm marine buffer zone around the site prohibits/largely restricts the use of gillnets and prevents/reduces harassment of birds at landing and rafting areas. Nevertheless, many of the guaneras have problems with introduced alien species, disturbance, illegal harvest, reduction in habitat extent/quality (mainly through guano extraction). There is a paramount need for all stakeholders to develop management plans for each of the main sites and to ensure that these are all linked and produced to a common standard.

3.5.4

A unique opportunity for the protection and management of the species inhabiting guaneras (both islands and coastal headlands) is currently under consideration with the proposed transfer of these sites to the Peruvian National Protected Areas system (SINANPE).

3.5.5

However, even if the legislation approving this transfer is passed, there are major challenges in both the short and medium-term. The short-term priorities are to ensure the availability of resources to support the continuation of the warden posts and facilities. This would entail reviewing roles and responsibilities of wardens and, where possible, employing experienced ex-wardens from local communities. If this succession is not ensured, most sites will be subject to high-levels of disturbance and depredation.

3.5.6

In the medium-term, the main priority is to develop (and implement) management plans for the system as a whole and for each individual site. These plans will need to cover both the sustainable operation of guano harvests (in terms of frequency, timing and manner of operation to minimise adverse effects on the biota), safeguarding (and restoring where necessary and feasible) the populations of native breeding species, removal of alien species and, where appropriate and feasible, development of alternative/supplementary sources of revenue for local communities (e.g. through ecotourism, habitat management roles, etc.). In addition, proposals for the management of adjacent marine habitat, particularly within the foraging range of the breeding seabird species, will also be highly desirable.

3.5.7

These tasks, which will need the active involvement of all stakeholders, is a complex and demanding challenge. However, it could lead to an exceptional outcome in terms of the integrated management of the habitats and resources of the most spectacular wildlife sites of the Pacific coast of the Americas.

3.5.8

The success of such a venture is likely to depend critically on the short-term (say 3-5 year) support from NGO coalitions and independent funding sources and, in the medium-term, on the ability of the complete stakeholder community to secure underpinning resources for at least the first 10-15 years of the implementation of the management plan.

3.5.9

It was agreed that every effort should be made by Workshop participants, particularly those with international connections, to secure immediate resources sufficient to put together a proposal for the emergency funding for the short-term priorities and to assist the Peruvian constituencies in convening the necessary initial workshop and national and international discussions necessary to establish the development of the management plan process.

One of the tasks of the "management plan group" should be to develop proposals for funding its implementation, once the main elements of the plan are established and agreed.

3.6 Other Species

It was noted that Lobos de Tierra would qualify as a candidate IBA solely based on its breeding population of about 100,000 pairs of Blue-footed Booby *Sula nebouxii*. No specific comments or issues were raised concerning the status of Inca Tern *Larosterna inca* (NT), which is widespread in small to medium numbers throughout much of the Peruvian coast and is a breeding species in many of the candidate IBAs being proposed on the basis of other species/assemblages.

4 Marine IBAs

BirdLife outlined the concept and practice behind the identification of Marine Important Bird Areas. In the Peruvian context, the types of Marine IBA likely to be most relevant are seaward extensions from breeding colonies (chiefly of relevance to guano sites and penguin (and diving petrel) colonies) and offshore Marine IBAs (mainly relevant to albatrosses, petrels and shearwaters frequenting offshore waters in their non-breeding seasons as migrants from outside the region).

4.1 Offshore Marine IBAs

It was noted that the extensive seabird-at-sea survey data and the limited (but increasing) tracking data available for the Humboldt Current system, indicated that most of the Humboldt Current offshore system would probably form a single candidate Marine IBA. This reinforces the importance, in such circumstances, of ensuring that the whole ecosystem is managed in an environmentally sensitive way, in particular in relation to interactions involving fisheries.

4.2 Seaward Extension of Breeding Colonies

Both direct (using empirical species and colony-specific data) and indirect (using estimated foraging distances for relevant species and/or ecologically-equivalent congeners) methods to delineate foraging ranges are potentially appropriate for penguins, diving petrels and guano birds. Relatively few empirical data exist for Peruvian seabirds. Data on foraging range of Humboldt Penguin (away from Punta San Juan) and for Guanay, Peruvian Pelican and Peruvian Booby, should be relatively straightforward to acquire and are prerequisites for assessing interactions with fisheries, as well as for delimiting core foraging habitat and potential Marine Important Bird Areas.

Studies of this kind, particularly at those guaneras likely to be representative of the foraging habitats in the different regions, are a high priority. The forthcoming tracking research in Peru by the French CNRS group in conjunction with IMARPE was noted to form an outstanding opportunity for such studies, as well as for ensuring that Peruvian scientists and students become familiar with techniques of instrumentation, data validation and analysis.

Existing data for booby species in Peru suggest foraging areas may not necessarily be contiguous with breeding colonies and probably vary substantially within and between years (presumably in relation to anchoveta movements). This illustrates the importance of obtaining empirical data on foraging areas and habitat for all the key species from a range of sites, seasons and, ideally, across several years.

4.3 Seabird at Sea Data

Range data from seabird surveys are valuable complements to remote tracking data, especially for assessing actual and potential overlap with fishing effort and with environmental variables, risks of oil pollution, etc. For the Humboldt current system, there is a considerable volume of data available, as indicated in the numerous publications by Spear & Ainley and by Ballance & Pitman (see references in Annex 3). It was agreed that it would be valuable if the owners of these data were able to arrange to combine their data and make them available for use (with appropriate rules of data access and use) by interested parties and organisations working in the Humboldt Current region.

5 Management of the Anchoveta Fishery

Changes in recent years in the abundance and availability of anchoveta and the distribution and intensity of fishing effort all suggest increased potential for competition between anchoveta fisheries (commercial and artisanal) and the community of top predators (seabirds, marine mammals, fish, etc.) which depend on anchoveta.

It was noted that addressing such interactions would be greatly assisted by enhancing the use of ecosystem approaches in the management of the anchoveta fishery, with particular reference to top predators. Specifically:

- (a) developing models for distributing the fishing effort so as to avoid repeated use of the same areas/times, thereby reducing risk of affecting particular species/colonies at critical times of year (e.g. when breeding);
- (b) reducing fishing effort in the key foraging areas for top predator species at places and times of year where these are particularly vulnerable (e.g. when breeding/provisioning dependent offspring/spawning);
- (c) ensuring that, overall, levels of escapement (e.g. as achieved through setting catch limits) from the anchoveta fisheries (and other fisheries as appropriate) are sufficient to allow for the requirements of dependent species (e.g. through using stock assessment models which explicitly include appropriate allowance for consumption (mortality) by top predators).

It was recognised, however, that the fundamental problems with the management of the anchoveta fishery, as diagnosed in the World Bank papers (see references in Annex 3), relate to chronic overcapacity in commercial (and artisanal) fisheries. Addressing this, even using all the methods suggested in the World Bank papers, is complex and difficult and, at least for artisanal fishers, may require the provision of alternative livelihoods.

It was noted that use of ecosystem models incorporating realistic estimates of ecosystem services will be important steps in the process of improving understanding of the socioeconomic aspects of the fishery management models.

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ANNEX 2 Specific Objectives

1 Seabird bycatch

1.1 Review current data and information on:

- ⇒ rates and levels of seabird (and other taxa as appropriate or relevant) bycatch in all fisheries in the Peruvian EEZ (and other seabird harvests as relevant)
- ⇒ area and time-specific variations in these
- ⇒ the main species affected.

1.2 Review current initiatives to address the situation through:

- ⇒ education
- ⇒ introduction of mitigation and management measures

1.3 Propose/develop a coordinated plan to reduce seabird bycatch to minimum levels, including consideration of:

- ⇒ improved data collection, especially by observer programmes where appropriate
- ⇒ education and outreach initiatives
- ⇒ use of appropriate mitigation measures, wherever feasible
- ⇒ involvement of the Agreement on the Conservation of Albatrosses and Petrels (ACAP) and other international agreements as appropriate and relevant
- ⇒ development by Peru of an FAO National Plan Of Action (NPOA-Seabirds)

2 Seabird Important Bird Area (IBA) breeding sites: protection and management

2.1 Review and revise preliminary list of all Peruvian candidate IBAs which contain breeding seabirds.

2.2 Review current status of all major seabird breeding sites/IBAs in relation to their protected area status and threats to site and species, especially in relation to alien vertebrates, guano extraction, site development and other human disturbance.

2.3 Propose/develop a coordinated plan for appropriate levels of protection and management on land of the main seabird breeding sites/IBAs in Peru.

3 Marine IBAs

Based on new BirdLife initiatives in relation to identifying and defining candidate marine IBAs, in particular in relation to seaward extensions of IBA breeding sites:

3.1 Review current data and information on:

- ⇒ foraging radii of the main Peruvian seabird species
- ⇒ key foraging areas in Peruvian waters identified from remote tracking studies of seabirds.

3.2 Consider how to apply these data to define appropriate boundaries to marine IBAs associated with major seabird breeding sites in Peru.

3.3 Consider (in conjunction with 4.2) desired management measures to apply within these IBAs (and within the Peruvian EEZ generally if appropriate) to reduce threats to seabirds.

4 Management of Peruvian anchoveta fishery

4.1 Review current management principles and practices of the Peruvian anchoveta fishery

4.2 Consider how to develop/implement a coordinated plan to improve the management of the anchoveta fishery to take account of:

- ⇒ the requirements of dependent species (including seabirds)
- ⇒ the needs of artisanal fishers
- ⇒ the need to fish in environmentally sensitive ways, especially reducing bycatch of non-target species

AGENDA

- 1 Seabird Bycatch**
 - 1.1 Waved Albatross**
 - 1.1.1 Data and resource needs
 - 1.1.2 Practical action needs
 - 1.1.3 Ecuador workshop and action plan
 - 1.2 Other species/issues**
 - 1.2.1 Penguins/gillnets
 - 1.3 ACAP engagement**
 - 1.4 Peru NPOA-Seabirds**
- 2 Seabird Distributions and IBAs**
 - 2.1 Breeding Sites**
 - 2.1.1 Database, IBA identification
 - 2.1.2 Protection and management of IBAs
 - 2.2 Sites at Sea (Marine IBAs)**
 - 2.2.1 Breeding site extensions/foraging radii
 - 2.2.2 Pelagic sites
 - ⇒ Satellite tracking data
 - ⇒ Survey data
 - 2.2.3 Site “management” and protection issues
- 3 Anchoveta Fishery**
 - 3.1 Ecosystem impacts**
 - 3.1.1 Annual catch-v-biomass estimates
 - 3.2 Impact mitigation**

ANNEX 3 List of documents

- 1 Waved Albatross**
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- 2 Seabird Tracking Data**
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4 Seabird at sea distribution, etc.

- 4.1 Spear, L.B., Ainley, D.G. & Webb, S. 2003. Distribution, abundance and behaviour of Buller's, Chatham Island and Salvin's Albatrosses off Chile and Peru. *Ibis* 145: 253-269.
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ANNEX 4

High-priority activities to collaborate in the reduction of incidental capture of marine birds

Participants:

IMARPE; APECO; ProDelphinus

IMARPE are the responsible authority for the co-ordination of data from participants.

A coordination meeting for the development of a national plan is necessary, in which functions and/or strategies of work will be agreed.

Also a schedule of coordination meetings (1 to 2 times per year), preceding the critical seasons (fishing seasons) is needed to identify: work areas, effort, season, ways of gathering data, etc. It is important to standardize collection of data (forms, baseline and basic data, etc.) as well as to distribute the observation effort amongst the different ports, in order to avoid duplication of effort. It is important also to work in a coordinated way to ensure appropriate qualification of observers.

It is necessary to establish an "agreement" among the participants by which the collected information can be analyzed correctly and to define the use of that information. Also, it is important to coordinate the work in relation to addressing directed capture (albatross hunting).

There are currently Observers in:

Paíta
Salaverry
Chimbote
Ilo

It is necessary to have Observers in:

Huacho
Callao
Pucusana
Huarmey
San José

ANNEX 5 Humboldt Penguin *Spheniscus humboldti*

In Peru, the conservation status of the Humboldt penguin continues to be critical. The total estimated population in the central southern zone in 2004 was approximately 3000-3100 individuals (adults and juveniles). Unpublished data from INRENA-APECO indicate around 5000 individuals along the Peruvian coast.

The primary threats for this species are mortality factors including entanglement in nets of the artisanal fishery, illegal capture for consumption and pet trade.

Guano extraction in the guano reserves, which contain an important proportion of the total population, continues to diminish active penguin habitat.

In accordance with the 2005 population estimate of 5000 individuals, an appropriate criterion to consider for candidate IBAs in Peru could be 1% (50 individuals) of the breeding grounds population in Peru. Four colonies (P. Islay, I. Chíncha Sur, I. Macabí, I. y Lobos de Afuera) were selected with fewer than this critical number because larger penguin groups were observed during previous censuses, and because improved protection status may encourage further expansion.

Total proposed IBAs in each of the main regions of Peru:

Southern Areas	Northern Areas	Total Proposed IBAs
17	5	22

List of potential IBAs for Humboldt Penguin, with indication of protection status and breeding status

Colonias Zona Centro-Sur	Lat (S)	Long (W)	Total estimate 2004	Protection	Reproduction
P. Coles	17*41.914'	71*22.468'	146	G	S
P. Cordel	17*15.395'	71*33.116'	163	N	?
P. Islay	17*00.656'	72*07.187'	37	N	?
Is. Hornillos	16*52.614'	72*17.119'	492	N	S
P. Caleta	16*30.945'	72*59.050'	79	N	?
Sombrerillo	15*29.990'	74*57.081'	80	N	?
Punta San Juan	15*21.692'	75*11.277'	783	G	S
Islote San Juanito	15*16.450'	75*14.341'	917	P	S
San Fernando o Pasadizo	15*08.829'	75*21.035'	67	N	S
Is. Santa Rosa	14*19.189'	76*09.498'	131	G, ANP	S
Tres Puertas	14*10.356'	76*12.778'	110	ANP	S
Is. San Gallan	13*51.234'	76*27.745'	101	ANP	S
Is. Ballestas	13*44.235'	76*23.664'	98	G, ANP	S
Is. Chincha Sur	13*38.948'	76*24.327'	31	G, ANP	S
Is. Chincha Norte	13*37.945'	76*23.453'	111	G, ANP	S
Is. Pachacamac	12*17.960'	76*54.185'	120	G	S
Is. Asia	12*47.209'	76*37.444'	206	G	S

Colonias Zona Norte	Lat (S)	Long (W)	Total estimate 2004	Protection	Reproduction
Isla Foca	5*12	81*12	150	N	S
Isla Palomino			200	G	?
Isla Valiente			200	N	S
Isla Macabi			30	G	S
Isla lobos de afuera	6*57	80*41	45	G	S

N= unprotected, G= Guano reserve, ANP= Paracas Reserve, S= Yes, ?= Unknown

Recommendations:

- 1 Continue the annual census of the total penguin population along the entire coast or at least in the 5 colonies that have been identified as most important.
 - ⇒ Censuses should be conducted both during the reproductive season and during the molting period. This will both reduce the potential errors created by the presence of nesting guano birds, and confirm nesting areas.
- 2 Continue monitoring the penguin population at Punta San Juan, and initiate studies in other areas of the northern and southern coasts.
- 3 Expand the Punta San Juan model to other areas in the guano reserves, to ensure the control and protection of these areas in respect of penguin activity during guano extraction.
 - ⇒ To delimit the nesting areas and increase the penguins' reproductive success, artificial nests ought to be employed. These nests have been employed successfully in Punta San Juan.
 - ⇒ Suggest that PROABONOS improve its control of organic waste during extraction phases, because it seems to have attracted rats to Punta San Juan.
 - ⇒ Restrict fishing in zones around breeding sites and/or strengthen the laws and regulations allowing access to the islands and guano headlands, in accordance with scientific reports of the foraging ranges of these species.
- 4 Implement environmental education programs directed at the general public (adults and children), primarily in the artisanal fishing ports near IBAs. This program should include local and national media, with emphasis on conservation and the current laws protecting the species.

ANNEX 6 Peruvian Diving Petrel *Pelecanoides garnotii*

Breeding Sites

Areas with documented reproduction: Isla La Vieja, Isla San Gallan, Isla Corcovado, At Isla Guañape Sur, there have been observations of individuals and footprints, indicating birds were prospecting for nest sites.

Conservation Priorities

- ⇒ Accord the highest levels of protection to Isla La Vieja and Isla Corcovado, and restrict access to research only, prohibiting both guano extraction and tourist use.
- ⇒ Implement effective control measures in Isla La Vieja and Isla Corcovado.
- ⇒ Improve enforcement and vigilance in Isla La Vieja and Isla Corcovado.
- ⇒ Enforce the protection of a marine area in the Bahía de Independencia and in the area surrounding Isla San Gallan, controlling fishing in order to avoid direct and indirect interactions.

Research Priorities

- ⇒ Establish a long-term population monitoring program at Islas Vieja, San Gallan and Corcovado.
- ⇒ Establish long-term ecological studies of diet in order to determine the functional role of the species in the ecosystem.
- ⇒ Determine foraging areas and their variability.
- ⇒ Establish long-term studies of reproductive ecology (with temporal and spatial variation) and demographic parameters (adult survival, recruitment). Develop indicators to evaluate the changes in the ecosystem (especially with regard to El Niño y La Niña).
- ⇒ Determine the natural variation in the “normal” ranges of the population to determine the cause of the observed changes (natural and anthropogenic effects).
- ⇒ Select specific reproductive colonies within the islands for monitoring, which can serve as indicators for the state of the population.
- ⇒ Evaluate the presence (and dynamics of occupation) on Isla Guañape Sur.
- ⇒ Using marked individuals and genetic studies, determine whether there is exchange of individuals between Vieja and San Gallan.
- ⇒ Assess the risk posed by introduced species.
- ⇒ Evaluate the feasibility of using artificial nests for repopulation and studies of the reproductive biology.
- ⇒ Experiment with recolonizing Isla Corcovado.

ANNEX 7 Peruvian Tern *Sterna lorata*

Population in Peru

Direct counts of individuals and active nests (containing eggs or chicks) within the last 10 years indicate a total Peruvian population of 725 individuals, with approximately 54 nests. Because it is based on direct counts, this should be interpreted as an extremely conservative estimate. In Chile, the number is estimated in 337-377 individuals and 91 nests (Guerra 2003). So the number of birds in Peru is about 66-68% of the total population, and accounts for 37% of known nests.

Suggested IBAs

There are three known nesting areas in Peru which should be considered for IBAs:

- 1 Pampa Lechuzas (Paracas, 13°53'S, 76°19'W).
- 2 Yanyarina (Marcona, 15°26'S, 75°03'W).
- 3 Paraíso Lagoon (Huacho, 10°55'S, 77°40'W).

Pampa Lechuzas (Amorós et al., 2007):

Max. Number of individuals in April 2007 = 450

Max. Number of active nests = 37

Threats to the colony = vehicular transit, fishermen, dogs.

Yanyarina (Zavalaga et al. In Subm.):

Max. Number of individuals in 2001 = 70*

Max. Number of active nests = 5*

Threats to the colony = vehicular transit, fishermen, dogs.

Peruvian terns in Pampa Lechuzas and Yanyarina nest 1-2 km inland on large barren plains with no vegetation. A higher number of nests and individuals in Pampa Lechuzas may be the result of a searching effort higher than in other localities, especially during the 2006-2007 breeding season (Amorós et al., 2007). Pampa Lechuzas was prospected with a larger number of observers and hours of observation. It is likely that a higher searching effort in Yanyarina will result in discovery of more nests.

Paraiso Lagoon (data from Tello et al. 2005):

Max. Number of individuals in 2005 = 24

Max. Number of active nests = 12

Threats to the colony = human disturbance, pollution.

The coastal Paraiso lagoon is located 1.5 km from the Panamerican highway, close to a small town and several chicken farms, and exposed to high levels of disturbance and pollution. The terns use a narrow sand tongue of 7 km (Tello et al. 2005) located between the ocean and the lagoon and it is frequently visited by people without any control.

Research Plan and short-term management needs

- 1 Explore historical nesting grounds which have not been visited recently: Pacasmayo, Punta Pativilca, San Pedro de Vice, Isla San Lorenzo, and the Virrila y Parachique estuaries.
- 2 Develop signage and trail systems within Paracas, Yanyarina and Paraiso lagoon, especially around the breeding areas. Educational materials and observation points should also be placed near the areas, for visitors.

IUCN Evaluation

The Peruvian Tern is currently listed as endangered according to IUCN, and Vulnerable according to the Peruvian government (Decreto Supremo 013AG 2004). According to the IUCN Red List Criteria, the Peruvian tern may be good candidate of Critically Endangered Species. From the five criteria used by IUCN to categorize a species as Critically Endangered, the geographic range (<100 km²) and area of occupancy (<10 km²) are the only criteria that may apply to Peruvian terns. A revision of extant Peruvian tern breeding sites and numbers in Peru and Chile is needed to evaluate the necessity of uplisting the category of Peruvian tern from Endangered to Critically Endangered.

In Peru, Peruvian terns should be uplisted from Vulnerable to Endangered based on the current evidence and the criteria used by the IUCN. Likewise, in Peru, these terns face the following threats:

- 1 Loss of nesting habitat- Many of the historical nesting areas are not currently used, because of human population growth in coastal zones. E.g. Puerto Viejo, Mollendo.
- 2 Absence from previously known localities. E.g. Paita, Chorrillos, Ancon.
- 3 The total known habitat in Peru (adding the areas of all three nesting sites) is only 6.5 km²

Report compiled by: Carlos Zavalaga, Samuel Amoros, Liliana Ayala, Gina Mori y Raúl Sánchez.

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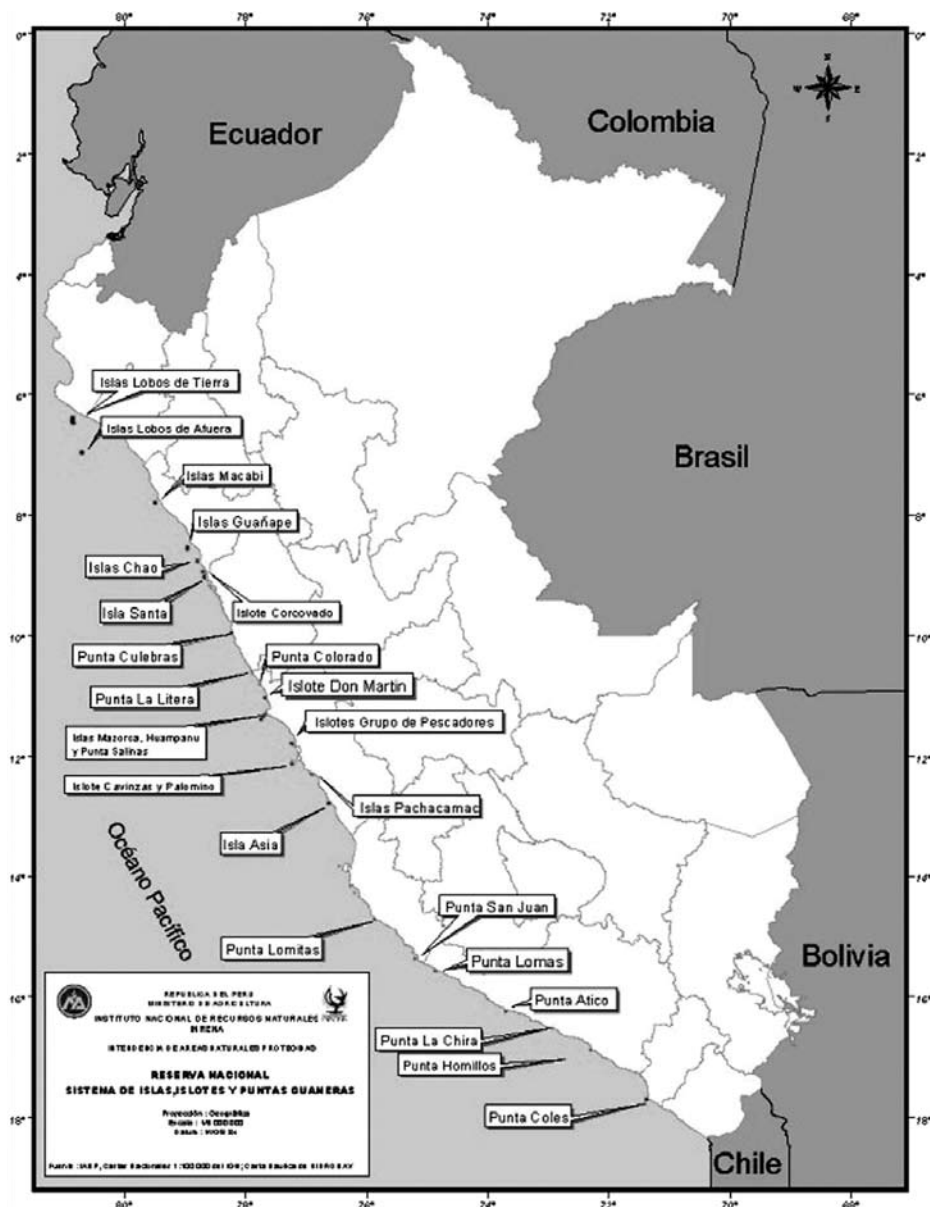
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ANNEX 8

Annex 8a

The location of principal colonies of guano birds, as candidate protected areas, in Peru. Map prepared and reproduced by courtesy of Instituto Nacional de Recursos Naturales (INRENA) of Peru. Reproduced by courtesy of Instituto Nacional de Recursos Naturales (INRENA) of Peru.



Annex 8b

Number of individual guano birds of each species (Guanay Cormorant (*Guanay P. bougainvillii*); Peruvian Booby (*Piquero S. variegata*); Peruvian Pelican (*Alcatraz P. thagus*)) breeding at each of the main guano colonies in Peru.

