



Agreement on the Conservation of Albatrosses and Petrels

Third Meeting of Advisory Committee

Valdivia, Chile, 19 – 22 June 2007

**REPORT OF THE FIRST MEETING OF THE SEABIRD BYCATCH
WORKING GROUP OF THE AGREEMENT ON THE
CONSERVATION OF ALBATROSSES AND PETRELS, VALDIVIA,
CHILE, 17-18 JUNE 2007**

Seabird Bycatch Working Group

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1. Introduction, welcome, membership and apologies

Professor Carlos Moreno welcomed all working group participants to the Universidad Austral de Chile in Valdivia.

The SBWG Convenor, Mr Barry Baker thanked Professor Moreno for his hospitality in providing facilities for the meeting, and welcomed members and observers (Appendix 1). Apologies were noted from Kim Rivera (USA) and Cleo Small (BirdLife International).

The Chair noted that there were a large number of observers present, and invited all attendees to contribute fully to the meeting. He also noted that the Agenda (Appendix 2) had been determined 2 months previously and, as there was limited time to deal with the business at hand, no new items would be able to be considered.

John Cooper was appointed overall *rapporteur* for the meeting, with contributory text being drafted by participants who made presentations (see below), as well as by several others.

2. Finalization of the Seabird Bycatch Working Group Strategy

The SBWG Strategy had received broad endorsement at the Second Session of the Meeting of Parties, held in New Zealand in November 2006. The Strategy has been revised to incorporate the views of the 2nd MoP (SBWG1_Paper 2). No discussion ensued and the document was then adopted.

3. Mitigation research updates

Agenda Item 3 focused on information sharing and included presentations highlighting initiatives specific to seabird conservation in longline, hook-and-line, and trawl fisheries. In particular, the intention was to provide an update on a similar information exchange that took place at a Pelagic Mitigation Workshop held in Hobart, Australia in October 2006 (AC3/Inf 18). Workshop participants and invitees provided brief summaries of their presentations, which are included below.

The workshop was told of a number of new developments, which included a new demersal longline system developed in Chile, development of bird scaring lines for Pelagic fisheries, an underwater bait-setting capsule, a bait pod and a smart hook that deny seabirds access to hooks during the setting process, safe leads that permit additional weight to be added to pelagic gear whilst improving the safety for fishers, the use of naturally occurring oils to deter seabirds from attending fishing operations, and the effectiveness of blue-dyed squid as a mitigation measure. The meeting also heard of new information on poorly known hook and line fisheries in Brazil, and mitigation research in Uruguay and Argentina. We were also provided with an update on BirdLife's Albatross Task Force which is providing an international team of mitigation instructors working with fishers and fisheries managers in global seabird bycatch 'hotspots'

Modification of fishing gear in the Chilean Patagonian Toothfish fishery to minimize interactions with seabirds and toothed whales (Carlos Moreno)

A new fishing technique was described (SBWG1_Paper 8), called the mixed or Chilean system, adapted from an artisanal fishery for Patagonian Toothfish. The artisanal system was modified to include a net sleeve that is placed on secondary vertical lines, which has practically eliminated depredation by Sperm and Killer Whales. In addition to this, the 15-m vertical lines carry a weight at the end, which provides a sink rate of 0.8 m/s. This causes the line to sink immediately behind the vessel preventing seabirds from seeing the baited hooks at the surface. Additionally, this system does not reduce catch per unit effort (CPUE) when compared to the traditional Spanish longline system. The performance of this fishing technique was evaluated with regard to seabird mortality and depredation of Sperm and Killer Whales on catch rate between September and December 2006. The gear was shown to be extremely effective, totally eliminating seabird mortality in spite of high numbers of Black-browed and Grey-headed Albatrosses present in the area.

Streamer (bird scaring) lines for pelagic systems (Ed Melvin)

Washington Sea Grant has initiated a research programme to develop a bird scaring-line system for application to world high-seas pelagic longline fisheries with funding from the David and Lucile Packard Foundation (SBWG1_Paper 7). In Phase One, an advisory committee will help fine-tune aspects of bird scaring-line design and develop logistical support in select southern hemisphere pelagic fisheries where seabird interactions are most intense. Bird scaring line design is focused on: 1) engineering widely applicable and easy to use deployment, retrieval and rigging systems, as well as towed devices that minimize the fouling of bird scaring lines on gear to maximize practical application by crews; and 2) identifying optimal bird scaring line materials, configurations, and performance standards that minimize seabird attacks on baited hooks. In Phase Two, controlled experiments will be conducted in two "worst case" pelagic fisheries to test the effectiveness of prototype bird scaring line(s) and the towed device

developed in Phase One. Experiments will contrast the mortality rate and, where appropriate, the attack rate of seabirds in response to the prototype bird scaring line and the towed body, to a control of no deterrent. If possible, one additional seabird mitigation technique will be tested with bird scaring lines in Phase Two.

Underwater bait-setting capsule (Graham Robertson)

Setting pelagic hooks underwater removes visual stimuli to seabirds and has the potential to reduce greatly, or even eliminate, seabird mortality. An Australian marine engineering company is currently developing an underwater bait-setting capsule for potential use by longline vessels worldwide (SBWG1_Paper 3). The underwater setter is the invention of New Zealand Dave Kellian and is designed to release baited hooks beneath the line of the propeller turbulence of vessels to a maximum depth of 10 m. The research and development phase is scheduled for completion by September 2007, which is when sea trials will commence. The sea trials will involve a) an assessment of the hook retention success of baits set with the capsule, and b) subjecting the bait-setting capsule to normal operational fishing for several months on at least two vessels to identify and rectify any operational issues that may emerge. The next step in the evaluation process will involve conducting an experiment on a chartered fishing vessel to determine the effectiveness in deterring seabirds of the three setting methods used by pelagic longline vessels throughout the world. The methods tested will be a) surface setting from the stern (the conventional method), b) surface setting from the side (commonly used in Hawaii, USA and by a small number of vessels in other nations), and c) underwater setting using the bait-setting capsule. The experiment should produce clear evidence on the most seabird-friendly method of setting pelagic longlines, and will be relevant to all pelagic longline fisheries in the southern hemisphere. The experiment is scheduled to occur between September and December 2008.

Bait pod (Ben Sullivan)

A bait pod is being developed that will be attached to the mainline and will open at pre-determined depths through a pressure diaphragm, which will be sealed in a solid high-impact polycarbonate casing. Baited hooks will be protected from seabird attack during setting by a rubber skirt. Each unit will weigh around 60 g and can be produced at around US\$2. A prototype is planned for late 2007, and initial trials will focus on operational characteristics such as handling during setting and hauling.

Safe lead weights for pelagic longline gear (Ben Sullivan & Graham Robertson)

The use of appropriate line weighting (e.g. weighted swivels) on branch lines in pelagic longline fisheries is recognized as a key premise to reducing seabird bycatch in pelagic longline fisheries. However, the uptake of appropriate line weighting in many pelagic longline fisheries has been hampered by the safety

concerns of fishers, with several serious injuries, and a death, being recorded in recent years when 'break-offs' occur. Fishtek (UK) and BirdLife International have been working together to develop the 'Safe Lead', which is a weight that is designed to fall from the branch line when the line breaks under pressure, thus preventing the weight from being catapulted toward the vessel. The weights can be used to replace weighted swivels or to be placed on the branch line below the swivel. If the leads are fitted above the swivel they have an added safety feature that allows the lead halves to separate from the carrier on impact (i.e. when the lead reaches the swivel). The Safe Leads also have the added operational advantage of reducing the time required to crimp weighted swivels onto the branch line, and they can be easily slide onto, and up and down a branch line by squeezing on a release-button mechanism. Safe Leads have been positively received by several ACAP Parties and trials to test their operational characteristics are currently being planned in Australia, New Zealand, South Africa and the USA (Hawaii).

Reducing seabird bycatch using natural deterrents (Johanna Pierre)

Experimental tests of the efficacy of the liver oil from School Sharks *Galeorhinus galeus* in reducing the numbers of seabirds attending fishing vessels, and the number of dives seabirds executed in pursuit of pilchard *Sardinops neopilchardus* baits, have produced varied results. In seabird assemblages dominated by Flesh-footed Shearwaters *Puffinus carneipes* and the globally Vulnerable Black Petrel *Procellaria parkinsoni*, shark liver oil was effective in reducing both numbers of seabirds attending vessels and the numbers of seabird dives on baits, compared to canola oil and seawater control treatments (Pierre & Norden 2006¹). However, shark liver oil did not deter a seabird assemblage dominated by five species of albatrosses (*Diomedea* sp. and *Thalassarche* sp.), giant *Macronectes halli* and *M. giganteus* petrels and Cape or Pintado Petrels *Daption capense* (Norden & Pierre 2007)². These results demonstrate the efficacy of shark liver oil (and some other fish oils; Norden & Pierre 2007) as a natural and biogenic deterrent for specific seabird assemblages, but confirm that not all species should be considered susceptible to its deterrent effects. Research underway includes trials in the Eastern Tuna and Billfish Fishery area off eastern Australia where the effects of oils and their ingredients on other seabird species and the mechanism by which the deterrent is effective will be investigated.

Smart hook development for pelagic fisheries (Barry Baker)

¹ Pierre, J.P. & Norden, W.S. 2006. Reducing seabird bycatch in longline fisheries using a natural olfactory deterrent. *Biological Conservation* 106: 406-415.

² Norden, W.S. & Pierre, J.P. 2007. Exploiting sensory ecology to reduce seabird bycatch. *Emu* 107: 38-43

An Australian company, Ahi Enterprises Pty Ltd, has developed a mitigation device that disarms the hook during setting. The 'safe hook' solution acts in two distinct and separate ways. Firstly, it minimises interaction by adding weight (c.30gms at the hook), increasing the sink rate, and secondly, it prevents hooking by creating a large barrier that covers the hook and prevents ingestion and accidental hooking during setting. The barrier detaches and falls away from the hook, after a short period of time, and when the baited hook is beyond the feeding range of seabirds & turtles. The degradable link is non-polluting, and the detached barrier corrodes naturally after some months in the marine environment. At this stage, working prototypes have been successfully produced and tested, and manufacturers identified, with negotiations underway for mass production. Ahi Enterprises are now preparing to test the hook and device in the marine environment, and are seeking collaborative working partnerships with governments, industry and conservation groups over the next year to assist at various levels.

Hook-and-line fisheries in Brazil (Tatiana Neves)

Paper SBWG1_Paper 5 provided information on a range of poorly known hook-and-line fisheries carried out by the Itaipava fleet, south-eastern Brazil, which involves a fleet of approximately 500 vessels deploying hooks between latitude 18-35°S, together with preliminary data on the impact on seabirds caused by the pole-and-line bait boats. The paper defines parameters such as gear, target species, fishing operation, season, areas, and the potential threat posed to seabirds, for seven different fisheries. Methods described include fast trolling for tuna and tuna-like species, slow trolling for Big-eye tuna, hand-lining, surface longline for Dolphin fish, pelagic longline for Swordfish, bottom drop-line, and pole-and-line with live bait. Bycatch observed during 16 cruises comprised 47 seabirds of six species. Capture rates were highest when fishing for Dolphin fish using surface longline gear (0.15 birds/1000 hooks), slow trolling for Big-eye Tuna (0.41 birds/day) and hand-lining targeting Yellow-fin Tuna (0.61 birds/day). Spectacled Petrels *Procellaria conspicillata* and Atlantic Yellow-nosed *Thalassarche chlororhynchos* and Black-browed *T. melanophris* albatrosses were the main seabirds caught. Monitoring the fleet and bycatch levels, development of mitigation measures, establishment of educational programmes, government control over the fleet and enforcement are urgently required for the hook-and-line fisheries described in the present study.

Mitigation research in Uruguay (Andres Domingo)

The activities of the Uruguayan longline fleet and its interaction with seabirds were reported. A summary on the achievements in seabird research and conservation of the Dirección Nacional de Recursos Acuáticos of Uruguay through its Pelagic Resources Department from 1998 to date was made, along with a recap of the activities of the Proyecto Albatros y Petreles from 2004 onwards. Thirty species have been recorded interacting with the longline fishery

and fourteen species identified as bycatch in this fishery. The three main species captured in the fishing area (25° to 39°S and 20° to 56°W) were *Thalassarche melanophrys*, *T. chlororhynchos* and *Procellaria aequinoctialis*. Detailed information was given on some of the mitigation measures in place and the NPOA Seabirds -Plan de Acción Nacional para Reducir la Captura Incidental de Aves Marinas en las Pesquerías Uruguayas- was presented.

Potential of blue-dyed bait (Mike Double)

Paper AC3_Inf 26 describes research examining the utility of blue-dyed baits to reduce seabird interactions with baited hooks set in pelagic longline fisheries. Spectrophotometric data and visual modelling suggest that blue dye does reduce the chromatic and achromatic contrast of the bait against the ocean background but is less effective with fish than with squid baits. At-sea presentation trials showed that the use of blue-dye had a strong mitigatory effect with squid but not with fish baits. These data suggest that bait type much be considered carefully when promoting or implementing this mitigation method.

Latest mitigation developments in Argentina (Marco Favero)

The Argentine trawl fishery is very complex and includes different fishing methods and diverse targets. So far, most of the information on seabird interaction and mitigation comes from the offshore “freshies” and the shrimp trawl fisheries. The “freshies” (primarily targeting Argentine Hake) comprise a fleet of roughly 150 vessels. Mortalities of Black-browed and Southern Royal Albatrosses have been confirmed in this fishery. In the shrimp trawl fishery, which is concentrated in central Patagonia, substantial advances were achieved. A mitigation method to reduce the mortality by collision with warp cables has been developed. The method uses traffic cones that are easily deployed during the operation, reducing the number and nature of contacts and mortalities (Gonzalez Zeballos *et al.* 2007³).

Longline fisheries in Argentina target three primary species: Patagonian Toothfish, South American Kingclip and Yellow-nosed Skate. In all cases the main species affected by the fishery were the Black-browed albatross and the White-chinned petrel. In the semi-pelagic kingclip fishery fishery, experiments on sink rates were undertaken in 2006 and experimentation with integrated weight longlines is expected to be undertaken in the near future, and the effect of gear configuration on albatross and petrel mortality was analyzed. The buoys used in semi-pelagic longlines may decrease the sinking rates of baited hooks near them, increasing the likelihood of seabird interactions and mortality. Bycatch in this fishery might be reduced by changing the gear configuration, either by not

³ Gonzalez Zeballos, D., Yorio, P. and Caille, G. 2007 Seabird mortality at trawler warp cables and a proposed mitigation measure: A case of study in Golfo San Jorge, Patagonia, Argentina. *Biological Conservation* 136: 108-116.

placing hooks near floats, or by using longer snoods when attaching the floats to the mainline (Seco Pon *et al.* 2007⁴).

Addressing seabird interactions with artisanal fisheries through community conservation: Longlines and coastal gillnets in Peru (Jeff Mangel)

This presentation summarized work by the Peruvian NGO Pro Delphinus, to assess and address seabird interactions in Peruvian artisanal longline and gillnet fisheries. The Peruvian artisanal fishery is large and diverse, containing approximately 9000 vessels and 40,000 fishers. Longline vessels target sharks and mahi mahi, set at the surface with an average of approximately 800 hooks, use weighted or unweighted branchlines and set gear in the morning and retrieve it in the evening. The gillnet vessels set surface drift nets targeting sharks. Nets are approximately 3km in length and are set in the evening and retrieved the next morning. From May 2005 to May 2007 onboard observers monitored for seabird interactions on 107 longline trips and 38 gillnet trips from 8 ports. A total of two black-browed albatrosses and three white-chinned petrels were observed taken by longline vessels yielding a CPUE of 0.006 captures/1000 hooks. Forty three seabirds, including 1 black-browed albatross and 9 white-chinned petrels, were observed captured on the gillnet trips yielding a CPUE of 0.151 animals/set. Our research has also identified the intentional taking of seabirds, primarily waved albatrosses, for human consumption. As part of this project Pro Delphinus also holds repeated workshops with fishermen and local officials to raise awareness of seabird biology and conservation. Educational materials have also been produced and distributed at ports to stakeholders to highlight aspects of seabird identification, conservation and safe handling and release techniques.

BirdLife Albatross Task Force (Ben Sullivan)

Through the BirdLife International partnership and collaborators the BirdLife Global Seabird Programme is continuing to expand its Albatross Task Force (Paper AC3_Inf 9), an international team of mitigation instructors working with fishers and fisheries managers in global seabird bycatch 'hotspots'. This involves conducting at-sea trips and holding on-shore workshops with fishers, fisheries managers, fisheries observers and compliance officers. BirdLife currently has three instructors based in Cape Town, South Africa with BirdLife South Africa (two in longline fisheries and one in the hake trawl fishery); and two in Brazil (Projeto Albatroz), working in pelagic fisheries, including the first engagement with the pelagic fleet operating from Itajai. In March 2007, three instructors were

⁴ Seco-Pon, J.P., Gandini, P.A. and Favero, M. 2007. Effect of longline configuration on seabird mortality in the Argentine semi-pelagic kingclip *Genypterus blacodes* fishery. *Fisheries Research* 85: 101-105.

employed in Chile, two working in the Swordfish fishery operating from Coquimbo and one half-time position based in Valdivia. The Chilean team are working with Professor Carlos Moreno (Centro Ballena Azul). The Global Seabird Programme is currently in the final stages of negotiations to deploy instructors in Argentina, Namibia and Uruguay during July-September 2007. This will exceed BirdLife's objective of having a team of 10 Albatross Task Force instructors working in global bycatch 'hotspots' by the end of 2007.

4. Coordination of Mitigation Research

The Working group recognised the need to identify a suite of research initiatives that can together provide critical information to establish the relative effects of mitigation technologies on seabirds, target fish and all other taxa. This would permit substantial advances in the development of best management practices that are effective and acceptable (safe, cost effective and reasonable) to the fishing industry and to fishery managers. This vision can best be realized through a collaborative approach that pools scarce resources (expertise, scientists and funding) and addresses appropriate seabird species and/or foraging guilds, fishery target species, and categories of fishing gear and vessels types. This collaboration might also include agreement on a common protocol for data collection and standardization of critical variables to be measured in mitigation research for pelagic fisheries.

A workshop on Seabird Bycatch Mitigation in Pelagic Longline Fisheries (Paper AC3/Inf 18) convened in Hobart, Australia in October 2006 by Ed Melvin of the University of Washington, U.S.A. had started to develop a mitigation research plan. Whereas current and future plans for mitigation research and related initiatives were discussed fully, time did not allow for work on the research plan.

The Working Group recognised that interactions with pelagic fisheries managed by RFMOs arguably constitute the largest conservation threat to seabirds in the southern oceans, and although several seabird avoidance measures have been trialed to varying degrees in pelagic fisheries, proven and accepted seabird avoidance measures require substantial improvement.

In order to progress the development of relevant mitigation research, the Working Group reviewed the information provided in AC3/Inf 18, taking account of new data presented at the Working Group meeting. It commenced on a process designed to develop a plan of research for pelagic longline fisheries, including identifying specific research experiments needed, principal investigators, best host locations, and possible funding sources.

In particular, it reviewed and revised information and recommendations in Appendix 2 and Appendix 4, Table 1 of AC3/Inf 18, in the light of new data provided to the Working Group and further expert opinion. It assessed that, from

a global research perspective, bird scaring lines, the bait setting capsule and side setting were the highest priority for research, weighted branchlines, the bait pod, smart hooks and circle hooks were high priorities; and blue dyed squid was of moderate priority. Research on technologies such as the underwater setting chute, night setting, line shooters, thawed bait, strategic offal discharge, blue-dyed fish, fish oil and bait casting machines, were considered a lower priority and were not discussed. With respect to night setting, the Working Group acknowledged the effectiveness of this mitigation measure, but believed further research on this was not needed. The revised tables are attached as, Tables 1 and 2, Appendix 4.

The Working Group proposed that the ACAP Advisory Committee endorse these tables (Tables 1 and 2, Appendix 4) as representing the current best scientific advice of ACAPs Seabird Bycatch Working Group, and encourage Parties to use these materials to guide the development of policy and practice within the fisheries under their jurisdiction.

In addition, the Working Group strongly encouraged Parties to collaborate on implementing the research initiatives outlined in Table 2 and, where possible, to prepare detailed research plans for consideration by the Working Group.

The Working Group noted that seabird mitigation research is challenging in several ways. Seabird bycatch is in general rare at the vessel level, even without mitigation. Seabird interactions and mortality vary spatially, temporally at several levels, by vessel, by environmental and operational variables, as well as by species and foraging guild. Collectively, these features necessitate staging research in locations where interactions are most intense (worst case) and call for experimental designs with controls and generally large sample sizes (millions of hooks and weeks to months at sea) in order to produce useful results. In addition, data are typically non-normal and (or) over-dispersed requiring sophisticated analyses. And of course, doing research on fishing vessels requires considerably buy-in by industry, and successful programs also require buy-in by related stakeholders.

Mitigation research can be classified into three categories, which are useful in research planning:

- 1) Pilot Research: defined as preliminary testing to determine the practicality and variability in performance of a specific device or devices - ideally a precursor to definitive research;
- 2) Comprehensive Research: defined as determining the effectiveness of specific mitigation technologies at reducing seabird mortality, as well as the effect on target species and all other catch of non-target organisms; and
- 3) Demonstration Research: defined as work repeating definitive work in a new location or with uninitiated fishers with a focus on implementation.

Pertinent elements of experimental design were also reviewed as a prelude to discussion of the research plan. These included the following: the pros and cons of controlled experiments, the need for material specifications and performance standards for mitigation technologies tested in research, determination of optimal sample size (focus on fish or birds), scope (number of hooks and number of vessels), as well as essential variables (bird CPUE, Fish CPUE, etc) and optimal variables.

Vessel Types and Gear Characteristics

Graham Robertson, Australia, provided a presentation on the types of vessels used in pelagic longline fishing and the characteristics of the gear used. An understanding of the nature and variation in fishing gear and vessel types most used in pelagic fisheries is fundamental to formulating plans for research of seabird bycatch mitigation technologies. The SBWG developed a summary of vessel and gear characteristics of the pelagic fisheries by target species where information was available (Appendix 4, Table 3). Information for some fisheries was unavailable at the time of the meeting, and members were asked to complete the table intersessionally. The information in Table 3, Appendix 4, clearly shows considerable variation in vessel features and gear configurations that will be of great value to planning research and best practice management.

Research Priorities

The Working Group looked at research priorities at two levels — 1) Members and Range States domestic pelagic fisheries, and 2) RFMO fisheries.

1) Range State Domestic Pelagic Fisheries

Parties and Range State represented in the Working Group identified technologies of high priority for research that would best assist them in determining the suite of mitigation technologies that would constitute best management practices in their fisheries. The Working Group noted that these are not research initiatives agreed to be carried out by represented pelagic longline nations, but rather acknowledgement that the need exists to determine the efficiency of specific seabird mitigation technologies to reduce seabird bycatch rates and effects on target catch and other taxa.

Research Priorities

Research priorities were categorized as Pilot, Comprehensive or Demonstration research using definitions above (Appendix 4, Table 4). At the domestic or EEZ level, development and testing of a pelagic longline bird scaring line was identified as a research priority by all but one nation. Branchline weighting, circle hooks and the bait setting capsule were identified as priorities for research by four of seven nations. Side setting and safe leads were identified as important by three nations. Blue-dyed squid and alternative gear for surface longline systems

for mahi-mahi (*Coryphaena hippurus*) were identified as important by two nations. Research on the bait pod and smart hooks, the influence of life status of bait (live vs. dead) on target and non-target fish species, and the effects of lightsticks and thawed bait on bycatch, were identified as important for research by at least one nation.

Best Locations to Stage Research

The Working Group agreed that seabird bycatch mitigation research should best be carried out in locations where seabird interactions with pelagic gear are most intense, as it is these locations that would yield the most useful research outcomes. Locations where aggressive species are most abundant and overlap with fisheries include the pelagic fisheries of Chile in winter, Uruguay and Brazil from May through September, and in South Africa in winter. BirdLife International reported that Albatross Task Force personnel are either in place or will soon be in place in Chile, Brazil, Uruguay, South Africa and Namibia and are available to collaborate in seabird bycatch mitigation research programs.

Specific Research Projects Identified

A couple of specific research projects were identified. Australia has led the development of the bait setting capsule, a device designed to deliver baited hooks to a depth beyond the access of foraging seabirds at the stern of a pelagic longline vessel (SBWG1/Paper 3). Graham Robertson has funding to develop the prototype and carry pilot research to demonstrate the efficient performance of the prototype capsule. Pending a positive outcome of pilot research, Dr. Robertson is seeking funding to carry out comprehensive research to determine the relative performance of the BCS, side setting and conventional stern setting. A location to stage this research effort has not been established at this stage.

The United States is developing plans to develop a streamer line system for pelagic longline fisheries and to trial the streamer line system in two “worst case” southern hemisphere, pelagic fisheries (SBWG1/Paper 7). Funding is in place to carry out this research. Trials will compare the relative efficiency of the streamer line designed to a control of no deterrent and to a second mitigation technology to be determined. The host locations will include South Africa and either Brazil, Chile or Uruguay. Work is scheduled to be completed in 2009.

New Zealand and Australia have procured “safe lead”, a new product which promises to eliminate safety issues related to weighted branchlines. It is planned to pilot-level test these weights in 2007 within Australian and New Zealand fisheries.

The Working Group agreed that the development of alternative gear for the surface fisheries for mahi-mahi in both Peru and Brazil should be pursued. It was noted that the Costa Rican fishery for mahi-mahi targets this species with subsurface gear using weight, and that this gear might provide alternatives for fisheries that currently use surface longline gear. It was suggested that

Technology transfer from Costa Rica to Peruvian and Brazilian fisheries could be facilitated initially through the 4th International Fisher's Forum, scheduled for November of 2007

Funding Sources

The Working Group discussed possible funding sources for the high priority research projects identified. The IATTO program derives contributions from Antarctic visitors, which are available annually to fund seabird mitigation research and other seabird conservation initiatives. The David and Lucile Packard Foundation, a non-profit philanthropy based in the US, has funded several seabird conservation initiatives in the last year and has a growing interest in this area. The ACAP Secretariat indicated that ACAP financial resources were not currently at a level that would allow funding of identified research at this time; however, as more nations join the agreement funds may become available for seabird bycatch mitigation research.

Regional Fishery Management Organizations (RFMOs)

The working group noted and welcomed the new initiatives by RFMOs to improve the implementation of mitigation measures for seabirds. In particular, it commended the approach requiring fishers to select two measures, to be used in combination, from a 'menu' of seabird mitigation technical measures. This approach had been developed within the WCPFC and was now under consideration by the IATTC. Both RFMOs provide mitigation options for individual vessels in a column A – column B format, where vessels must select one primary or mandatory technical measure from Column A and one or more secondary or complementary mitigation technical measures from Column B, when fishing in specified areas where seabirds are at risk. An example of this approach is set out in Appendix 5, Further information can be found at (Conservation and Management Measure 2006-02, Attachment G, Report of WCPFC Third Regular Session, 11-15 December, 2006, <http://www.wcpfc.int/>;))

The Working Group further noted that based on its review of the current applicability of seabird mitigation measures in pelagic longline fisheries, some of the measures currently listed by WCPFC and/or IATTC would benefit from further development and testing.

Important issues include:

- a) resolving inconsistencies in the recommendations of WCPFC and IATTC in respect of streamer lines;
- b) the need to better define side-setting methods and to test them in higher latitude fisheries, especially those with diving seabirds and a diversity of albatross species;

- c) the inappropriateness of using bait casting as a recommended mitigation measure; and
- d) that current underwater setting techniques are not yet suitable for recommending for general application.

In particular, the Working Group recommended that its advice on current best practice mitigation, including the application of combinations of measures (Appendix 4, Table 2) be provided to all relevant RFMOs. In particular, this advice needs to be provided both the Secretariat for dissemination at RFMO meetings, and the ACAP parties for use within domestic delegations.

5. RFMO progress update and planning for future meetings

Brief reports were provided to the Working Group on the recent meetings of key Regional Fisheries Management Organizations (RFMOs), as recorded by representatives and/or designees of ACAP.

Joint Tuna RFMO Meeting, Kobe, Japan, January 2007

The ACAP Executive Secretary attended the Joint Tuna RFMO meeting and spoke to Paper AC3/Inf.11. The members and cooperating non members of the world's five tuna RFMOs met in January 2007 in Kobe, Japan to discuss how they could work together to address the current crises facing many of the world's tuna stocks, which include the need for improved management responses to deal with depleted stocks, the need to reduce fishing over-capacity and IUU activities. Also on the agenda were other issues of 'concern to the international community' which include the principle threat to albatrosses and petrels, seabird bycatch. Observers were permitted to provide comments during the discussion, but were specifically excluded from two half day sessions, during which a Course of Actions for RFMOs was to be drafted.

The meeting acknowledged that implementation of the precautionary approach and an ecosystem-based approach to fisheries management, including improved data collection on incidental bycatch of non-target species and establishment of measures to minimize the adverse effects of fishing on ecologically related species, particularly seabirds, turtles and sharks, was a key area and challenge for all tuna RFMOs. The meeting agreed to establish a Technical Working Group to address IUU fishing and stock assessment issues. However, despite strong statements from a number of delegations, particularly Australia, Canada, New Zealand, Norway and the United States, ACAP, BirdLife International and WWF, the meeting did not agree to include risk assessment of non-target species and development of bycatch mitigation measures amongst the issues to be dealt with immediately by the Technical Working Group. Not even the offer by WWF and BirdLife to find the necessary resources to support this work was sufficient to gain the support of the meeting for this approach. While the meeting made progress in establishing a process to deal with fishing over-capacity and stock

assessment matters, the failure to act immediately on the bycatch issue was considered very disappointing.

The Working Group identified the need to develop a strategy in advance of the next Joint Tuna RFMO Meeting in 2009, to build RFMO support for a more progressive approach to bycatch issues.

ICCAT Sub-Committee on Ecosystems, 19-23 February 2007

The United Kingdom reported on the recent meeting of the ICCAT Sub-Committee on Ecosystems (AC3/Inf.7), indicating that good progress had been made in the identification of the need for ICCAT to undertake a risk assessment on the impact of ICCAT fisheries on seabirds. There was widespread support of conducting this assessment within the Sub-Committee and a belief that the results of such an assessment could be effectively transmitted to the Commission, as they become available. It was reported that Australia, UK and the USA were all committed to providing financial assistance to ICCAT for carrying out the assessment in a partnership also involving BirdLife International, with encouragement to others to do the same. It was also noted that the Sub-Committee had reiterated its previous recommendation to hire a bycatch coordinator and that ICCAT would be open to accepting outside funds for this purpose.]

At the Sub-Committee meeting there was considerable discussion of a six-stage draft framework for the assessment of the impact of ICCAT fisheries on seabirds; The first stage — identification of seabird species most at risk in the ICCAT area, forming a preliminary Ecological Risk Assessment — was undertaken at the meeting. Further stages of the assessment will proceed intersessionally.

The ICCAT Sub-Committee also proposed that ICCAT develop educational materials for fishers on seabird bycatch, that it should review its existing observer programmes and best practices for collecting bycatch data, and that this review be used to update the ICCAT manual. In discussion on the effects of circle hooks, it concluded that although they greatly reduced mortality of turtles, they may not be the best technological solution and further research was recommended.

The Working Group requested the Advisory Committee to recommend that ACAP Parties that are also members of ICCAT give strong support to the establishment of the bycatch coordinator post at ICCAT and, in addition, that ACAP, through the Bycatch Working Group or Advisory Committee support the development of educational materials, and the provision of advice on best practise data collection and on effective seabird bycatch mitigation measures to ICCAT. The Advisory Committee should also recommend that members include seabird experts within national delegations to scientific meetings.

WCPFC Risk Assessment Workshop

The WCPFC is conducting an Ecological Risk Assessment Workshop on 6-10 August in Honolulu, Hawaii, immediately prior to WCPFC Scientific Committee (13-24 August). ACAP has been invited to attend this meeting, which will look to employ similar methodologies to those developed by CSIRO in Hobart, Australia, and currently being used in the ICCAT risk assessment process. The Convenor undertook to provide a report on this meeting to the Working Group when it next met.

CCAMLR

The USA provided a report on CCAMLR IMAF meeting (Paper AC3/Inf 3). CCAMLR's work on reducing seabird bycatch within its fisheries was widely recognised and other RFMOs could benefit from CCAMLR's experience. It was noted at the IMAF meeting that some of the seabird species that breed within the territories of CCAMLR member nations are being killed within fisheries outside of CCAMLR's regulatory area. As such, IMAF members indicated that CCAMLR should maintain a close working relationship with adjacent RFMOs and encourage transfer of information and technologies, as appropriate, to facilitate the rapid uptake of seabird bycatch mitigation measures outside of the CCAMLR management area. It was also noted that CCAMLR, through application of its conservation measures, had reduced seabird bycatch dramatically, with no albatross species being taken in 2006.

CCSBT Ecologically Related Species Working Group

New Zealand reported on the most recent meeting of the CCSBT Ecologically Related Species Working Group, held in Kaohsiung, Taiwan in February 2006. New Zealand indicated that this group has not made much progress since its inception and, given an inability to provide firm recommendations to the Commission, consideration was being given to disbanding the Working Group. However, New Zealand reported that the most recent meeting produced some renewed enthusiasm about the work of the group, with some progress being made toward the development of resolutions on bycatch and data collection. New Zealand indicated that the next meeting of this group is planned for July, 2007, in Tokyo, Japan. ACAP parties Australia and New Zealand will attend the meeting, together with an observer from the ACAP Secretariat. Co-operating non-members South Africa and the European Community may also attend. It is hoped that the draft resolution on seabird mitigation measures, developed but not finalized at the last meeting, will be recommended to the Scientific Committee and the Commission for adoption.

IATTC

The USA and BirdLife International reported on the recent meeting of the IATTC's Stock Assessment Review Working Group (SARWG) (AC3/Inf 2). It was noted that the IATTC Secretariat had provided a paper to the SARWG, describing ways in which the IATTC could address seabird bycatch. There had been a productive discussion surrounding this document and that the group discussed the possibility of following WCPFC's two-column approach to adopting seabird bycatch mitigation measures. It was also noted by the USA that this potentially represents a positive trend of the RFMOs working together to address the ecological impacts of their fisheries on adjacent areas. The SARWG also discussed the need to standardize data collection for documenting seabird bycatch and for considering the ecological impacts of IATTC fisheries on seabird populations.

During the report of this meeting, the USA pointed out that the IATTC Secretariat has technical capacity that the SBWG could potentially utilize as it moves ahead with testing and adoption of bycatch mitigation measures and assessing the impact of fisheries on seabirds. The SBWG agreed to provide the USA and BirdLife International with input on the mitigation measures currently under consideration by the IATTC for discussion at the IATTC's annual meeting in the coming days. Particularly relevant in this regard is the development of the ACAP Research Plan for Pelagic Longline Fisheries.

IOTC Working Group on Bycatch, Seychelles, July 2007

The SBWG Convenor advised that he would be representing ACAP at the forthcoming 3rd meeting of the IOTC Working Group on Bycatch, to be held in the Seychelles, on 11-13 July 2007. The agenda was not yet available, but ACAP was intending to raise concerns over the exemptions currently given to longline vessels targeting swordfish and utilising the "American longline system", from the requirements of Resolution 06/04 which mandate the use of bird scaring lines when fishing south of latitude 30 degrees South. The resolution states that the "American longline system" means the use of light monofilament gear components for both mainline and droplines, incorporating light sticks, which, by design, ensures baits will sink rapidly when this gear is set. The Working Group was unaware of any data that supports the effectiveness of the American longline system in mitigating seabird bycatch, although setting gear at night, which is common practice when targeting swordfish, would have some mitigatory effect.

BirdLife International advised that it was their intention to present information on the South African Swordfish fishery at the meeting.

Issues arising from discussion on RFMO meetings

It was noted that an important issue for RFMOs in relation to introduction of new or modified mitigation measures is the need to have demonstrated that these do not have negative effects on fish catch rates. The Working Group recommended that, where possible, experimental tests of mitigation measures should include the collection and analysis of appropriate data on fish catch rates. However, the Working Group also recognized the importance of ensuring the introduction of adequately-tested mitigation measures was not unduly delayed by the need to test effects on fish catch in all circumstances (e.g. areas, target species, vessel types, etc.) within the area of application of each RFMO. The Working Group recommended that, where relevant, the necessary experimental work should be developed (and resourced) on a joint basis between the appropriate fishery and environmental management constituencies.

The Working Group also noted that there was a plethora of meetings conducted by RFMOs, with most holding at least 3 or 4 meetings a year, many of which would have agenda items of relevance to the work of ACAP. Adequate representation at all these meetings had severe financial implications to the Agreement, and was clearly beyond the capacity of the Secretariat at this stage. There was a need to identify and prioritise meetings of particular relevance to ACAP, and Parties and Range States who are members of RFMOs were requested to assist the Secretariat in this process. Development of an Interaction Plan to assist ACAP Parties to engage and assist RFMOs and other relevant international bodies in minimising bycatch of seabirds was seen as an essential approach to managing this issue (see draft Work Program Appendix 3). A table summarising details of ACAP Parties, Signatories and Co-operating Non-Signatories, and their membership in RFMOs, was prepared by the Working Group to encourage better communication coordination of activities between all who are actively engaged in with RFMOs.

ACAP Parties, Signatories and Co-operating Non-Signatories, and their membership in RFMOs

State	ACAP	CCAMLR	CCSBT	WCPFC	IOTC	ICCAT	SEAFO	IATTC
Argentina	R	M						
Australia	R	M	M	M	M			
Brazil	S	M				M		
Ecuador	R							M
Brazil	S	M				M		
France	R	M		M	M	M ⁵		M
Namibia	C	M				M	M	
New Zealand	R	M	M	M				
Norway	R	M				M	M	
Peru	R	S						M
South Africa	R	M	C		C	M	S	
Spain	R	M						M
UK	R	M			M	M ⁶	S ⁷	
Uruguay						M		
USA	C	M		C		M	S	M

R = ratified/acceded/approved, S = signatory, M = member, C = co-operating non-signatory.

6. NPOA-Seabirds Best-practice guidelines

As requested by the second meeting of the Advisory Committee, BirdLife International provided an update on the development of FAO best practice guidelines to strengthen the delivery of the IPOA-Seabirds by providing a more robust and uniform set of NPOA-Seabirds. At the 27th meeting of the FAO Committee on Fisheries (COFI, Rome, March 2007), several ACAP Parties (Australia, Chile and New Zealand), signatories (Brazil) and co-operating non members (USA and Canada) supported a proposal for the FAO to hold an expert consultation to develop 'best practice' guidelines. COFI agreed that depending on cost and related considerations such guidelines would be developed through joint work between the FAO and related bodies. ACAP, along with CCAMLR and BirdLife International, were acknowledged as key organisations in that context.

The COFI report clearly provided support for the development of guidelines to assist States and RFMOs to reduce seabird bycatch in longline and non-longline fisheries (e.g. trawl and gillnet fisheries). The working group was requested to become a partner in this FAO initiative and to provide AUS\$13,000 to assist in holding the consultation. The United States noted its support for the project and

⁵ On behalf of St Pierre & Miquelon

⁶ On behalf of UK Overseas Territories

⁷ On behalf of St. Helena and its dependencies, Tristan da Cunha and Ascension Island

indicated that it was committed to providing funding to help support the workshop. The group agreed that this was a priority and recommend to the Advisory Committee that the funding is provided.

The Working Group noted that there were a number of useful documents that could be provided by ACAP to an expert consultation. These included International observer reports provided to this meeting, technical reviews of mitigation measures previously submitted to ACAP meetings (e.g. AC2/Info 1), and this report.

7. Work Programme, 2007-2009

The Work Programme for the Working Group was updated and is attached.

Discussion took place on the need to interact with fishing nations who are not members of RFMOs. The Working Group acknowledged that some fishing nations were undoubtedly having a severe impact on populations of albatrosses and petrels. However, it was decided not to adopt this as a listed task in the work programme, due primarily to the heavy work load already identified and the lack of success obtained by ACAP parties in seeking to engage with these nations over other issues. The USA observed that it would be making such approaches of its own and would keep ACAP informed of outcomes.

The problem of the intentional capture of albatrosses for human consumption by the South Atlantic squid-jigging fishery was noted, but after discussion it was not considered to form part of the Seabird Bycatch Working Group's terms of reference. This matter is referred to the Advisory Committee for consideration of an appropriate course of action to address this threat.

8. Seabird bycatch bibliography and reference library

The Convenor reported on progress achieved to date in developing reference library and a bibliography on seabird bycatch, to assist Working Group members with their work (AC3/Doc 21).

The Working Group supported this initiative and some members offered to support the Secretariat in providing references and access to other electronic bibliographic databases. A 1997-2000 key-worded bibliography of longline bycatch literature (c. 850 titles) was held by the BirdLife Global Seabird Programme in Cape Town with an electronic version curated on the Australian Antarctic Division web site. It was agreed that the Convenor would investigate the importing of this into the ACAP bibliography.

9. Indicators

(SBWG1 Paper 10)

New Zealand gave a short presentation on indicators to measure the success of ACAP, including indicators of pressure from fisheries bycatch and responses to that pressure. BirdLife International provided some examples of potential indicators, as set out in AC2 Doc 20. The group was asked to consider how the development of indicators might fit with the work programme of the group when data to support the indicators might be available.

It was acknowledged that the development of indicators relating to pressure from fisheries bycatch was more complicated than the development of indicators related to the work of the working groups on breeding sites and status and trends, and that data on which to base such fisheries related indicators was currently sparse. The group agreed to keep the development of fishery related indicators under consideration, seeking guidance from other working groups as they developed indicators for their work. It was also agreed to further discuss this issue when the Working Group next met.

10. Meeting closure

The Convenor closed the meeting and thanked the host for the catering provided and all the participants, especially Ed Melvin and Graham Robertson, for their valued contributions to the planning and execution of the meeting's agenda. The meeting participants thanked Mr Baker for his able convenorship of the working group since its inception and for running a productive meeting.

APPENDIX 1:

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ANNOTATED AGENDA AND SCHEDULE

1. Introduction / Welcome

- Carlos Moreno will give a brief welcome and introduction to the meeting.
- Chair will provide introductory remarks
- Introduction of participants

2. Finalisation of Seabird Bycatch Working Group Strategy

The SBWG Strategy received broad endorsement at MOP 2. The Strategy has been revised to incorporate the views of the MOP and is provided to the Working Group for information/final endorsement.

Relevant Paper: SBWG1_Paper 2_ACAP Bycatch Working Group Strategy - April 2007.doc

3. Mitigation research update

- Spanish demersal system developments (Carlos Moreno)
- Streamer lines for pelagic systems (Ed Melvin)
- Underwater setting capsule (Graham Robertson)
- Bait pod (Ben Sullivan)
- Safe leads for pelagic LL gear (Ben Sullivan & Graham Robertson)
- Fish oil (Johanna Pierre)
- Mitigation research in Uruguay (Andres Domingo)
- Smart hook development for pelagic fisheries (Barry Baker for Hans Jusseit)
- Artisanal fisheries in Peru (Jeff Mangel)
- Mitigation research in Brazil (Tatiana Neves)
- Mitigation research in Argentina (Marco Favero)
- Albatross Task Force (Ben Sullivan)

Relevant Papers:

SBWG1_Paper 3_Robertson 2007_Underwater bait setting capsule for pelagic LL fisheries.doc
SBWG1_Paper 4_UK Update on mitigation for South Atlantic demersal Llers & trawlers.doc
SBWG1_Paper 5_Bugoni et al 2007_Hook & line fisheries in Brazil.doc
SBWG1_Paper 8_Moreno et al 2007_Cachaloterias - Seabird & mammal mitigation
in Chilean toothfish fishery.pdf

4. Mitigation Research Plan

A workshop on Seabird Bycatch Mitigation in Pelagic Longline Fisheries held in Hobart in October 2006 had planned to develop a mitigation research plan. While current and future plans for mitigation research and related initiatives were discussed fully, time did not allow work on the research plan. Following up on the work of this meeting, the SBWG will develop the framework for a 3-year mitigation research plan.

The Mitigation Research Plan is seen as comprising a short document of text with summary tables. (Ed Melvin).

Relevant Papers:

SBWG1_Paper 6_Pelagic LL Mitigation Research Plan - Outline.doc
SBWG1_Paper 7_Melvin 2006_Pelagic LL fisheries best-practice mitigation proposal.doc
SBWG1_Paper 11_Petersen et al 2007_Benguela ecosystem approach to fishing.pdf
AC3/Inf 18_Pelagic Workshop Rep.pdf

5. Work Program for SBWG

An Indicative Work Program was developed at AC2 (AC2/Doc 36) but has not progressed pending finalisation of the Working Group strategy. The SBWG will review the Indicative WP and finalise a Work Program for the Group (Barry Baker).

Relevant Paper:

SBWG1/Paper 9_Advisory Committee Work Programme.doc

6. RFMO progress update and planning for future meetings

—Joint Meeting of tuna RFMOs, Kobe, Implications for ACAP, particularly Ecological Risk Assessment

(Barry Baker).

— ICCAT Ecological Risk Assessment workshop February 2007 (Richard Phillips)

— WCPFC ecological risk assessment planned workshop August 2007 (Barry Baker)

— CCAMLR IMAF 25 report (Kim Rivera, presentation by Ed Melvin)

— CCSBT ERSWG planned meeting July 2007 (Johanna Pierre)

— IATTC (Kim Rivera, presentation by Nicole Le Bouef)

— IOTC Bycatch Working Group planned meeting July 2007 (Barry Baker / Cleo Small)

Relevant Papers:

AC3/Inf 2_IATTC_report.pdf

AC3/Inf 3_CCAMLR_report.pdf

AC3/Inf 5_Australian observer's report on CCSBT.pdf

AC3/Inf 6_Observer_Report_WCPFC.pdf

AC3/Inf 7_ICCAT Report_Espanol.pdf

AC3/Inf 13_Observer Report - FAO Committee on Fisheries.pdf

7. NPOA-Seabirds Best Practice Guidelines (Ben Sullivan)

At the March 2007 COFI meeting it was agreed that FAO, in cooperation with relevant bodies, would develop best practice guidelines to assist countries and RFMOs in implementation of the IPOA-Seabirds and that best practice guidelines should extend to other relevant fishing gears. ACAP and Birdlife International were identified at the meeting as some of the most relevant bodies in this context.

SBWG will discuss how to assist in this development and, in particular, consider the request for provision of funding of \$10,000 to support an Expert Consultation/ technical workshop.

Relevant Paper:

AC3_Inf 25_BPG IPOA Seabirds.pdf

8. Seabird Bycatch bibliography and reference library

Many members of the Working Group have maintain bibliographies on bycatch mitigation and albatross and petrels. ACAP has recently commenced work on a consolidated bibliography of key references as a useful tool for ACAP and its Working Groups. A similar tool has been developed by the Chair of the Taxonomic Working Group and is available for use by that Working Group through a secure weblink. The support of the Working Group in providing references for

inclusion in the database and the ACAP library is sought, together with views on the best way for this information to be distributed.

Relevant Paper:

AC3/Doc 21_Database of relevant scientific literature.pdf

9. Indicators (Spencer Clubb / Ben Sullivan)

Following the broad endorsements of AC2 and MOP2 for the progression of a set of Indicators for ACAP, Spencer Clubb (NZ) has written to the SBWG Convenor requesting that we consider how the working group may be able to contribute to the development of indicators. In particular, the SBWG is asked what data may be suitable as a basis for one or more indicators and when such data may be available. A similar request has been made of all other Working Group convenors.

Relevant Paper:

SBWG1/Paper 10_Indicators paper for Bycatch Working Group.doc

List of papers

Document Title	SBWG1 Agenda Item
SBWG1/Paper 1_Agenda.doc	
SBWG1/Paper 2_ACAP Bycatch Working Group Strategy - April 2007.doc	2
SBWG1/Paper 3_Robertson 2007_Underwater bait setting capsule for pelagic LL fisheries.doc	3
SBWG1/Paper 4_UK Update on mitigation for South Atlantic demersal LLers & trawlers.doc	3
SBWG1/Paper 5_Bugoni et al 2007_Hook & line fisheries in Brazil.doc	3
SBWG1/Paper 6_Pelagic LL Mitigation Research Plan - Outline.doc	4
SBWG1/Paper 7_Melvin 2006_Pelagic LL fisheries best-practice mitigation proposal.doc	4
SBWG1/Paper 8_Moreno et al 2007_Cachaloterias - Seabird & mammal mitigation in Chilean toothfish fishery.pdf	3
SBWG1/Paper 9_Advisory Committee Work Programme.doc	5
SBWG1/Paper 10_Indicators paper for Bycatch Working Group.doc	9
SBWG1/Paper 11_Petersen <i>et al.</i> 2007_Benguela ecosystem approach to fishing.pdf	4
AC3 Documents	
AC3/Doc 21_Database of relevant scientific literature.pdf	8
AC3 Inf Papers	
AC3/Inf 2_IATTC_report.pdf	6
AC3/Inf 3_CCAMLR_report.pdf	6
AC3/Inf 5_Australian observer's report on CCSBT.pdf	6
AC3/Inf 6_Observer_Report_WCPFC.pdf	6
AC3/Inf 7_ICCAT Report_Espanol.pdf	6
AC3/Inf 9_BirdLife report.pdf	3
AC3/Inf 13_Observer Report - FAO Committee on Fisheries.pdf	6
AC3/Inf 18_Pelagic Workshop Rep.pdf	4
AC3/Inf 25_BPG IPOA Seabirds.pdf	7
AC3'Inf 26_Potential of blue-dyed bait ACAP.pdf	3
AC3 Documents and Inf Papers of relevance to SBWG but not discussed at SBWG1 Meeting	
AC3/Doc 23_Analysis of remote tracking data.pdf	
AC3/Doc 28_Waved Albatross workshop report.pdf	
AC3/Inf 14_Observer Report Regional Fishery Bodies Secretariat Network Meeting.pdf	
AC3/Inf 17_Best practices for collection of longline data_USA.pdf	
AC3/Inf 19_Shay and White-capped Albatross bycatch project report.pdf	
AC3/Inf 21_SSS Capacity Building Report.pdf	

APPENDIX 3

**REVISION OF SECTION FOUR OF ADVISORY COMMITTEE WORK
PROGRAMME 2007-2009**

	Topic/Task	Responsible group	Timeframe	Detail (where relevant, an indicative cost in Australian dollars is given)
4.	Fisheries interaction			
4.1	Analysing existing remote tracking data and complete initial reports on overlaps with fisheries	BirdLife under contract to ACAP	AC4	Analyse the distribution data for all ACAP species within areas managed by key RFMOs (This text is as was in original AC work plan and overlaps heavily with Item 1 of SBWG indicative work plan) (AU\$ 25,000)
4.2	To consolidate Seabird Bycatch Working Group	Parties with assistance of Convenor of SBWG and Secretariat	End of August 2007	France, Spain, Peru, Ecuador and Norway and further interested Range States to nominate working group members
4.3	Develop a strategy for ACAP and Parties to engage and assist RFMOs and other relevant international and national bodies to assess and minimise bycatch of albatrosses and petrels	SBWG	MoP2, AC3	COMPLETED
4.3.1	Develop an interaction plan for ACAP and relevant Parties to engage and assist RFMOs and other relevant international bodies to assess and minimise bycatch of albatrosses and petrels	SBWG	1) End Sept 2007 2) End Nov 2007 3) End Jan 2008 4)Final product for AC4	1) Convenor of SBWG/Secretariat with any necessary support to develop draft interaction plan for consideration of SBWG; 2) Comments by SBWG and National Contact points; 3) Revision complete Plan to include who responsible for lead on each RFMO/international body (including Secretariat), which Parties and Range States need consultation (see Table x in meeting report), record keeping, analysis of needs of each RFMO and identification of products

	Topic/Task	Responsible group	Timeframe	Detail (where relevant, an indicative cost in Australian dollars is given)
4.4	Review and utilise available information on foraging distribution and seabird bycatch to assess the risk of fishing operations on ACAP species in fishing regions (e.g. RFMO areas of competence, national EEZs)	SBWG	AC4 to review progress	Note overlap with 4.1, use output from BirdLife contract. Note recent progress with three RFMOs on risk assessment
4.5	Review information on mitigation measures for fishing methods known to impact albatrosses and petrels	SBWG (New Zealand/UK lead for trawl; Chile/UK/ Argentina lead for demersal longline)	AC4 initial review, final product MoP3	Initial work focused on pelagic longline methods (completed AC3); focus should next be on trawl interactions and demersal longline. Initial material for work within meetings to establish the SPRFMO would be helpful in the near future.
4.6	Develop generic products to assist RFMOs and other relevant international and national bodies in reducing seabird bycatch	SBWG Convenor /Secretariat, with other SBWG consultation to review needs	Discuss at AC4	Observer programme designs including protocols for the collection of seabird bycatch data, analytical methods for assessing seabird bycatch to be examined first. Note that this needs to consider more than just data collection, e.g. training, operational issues.
4.8	Develop specific materials and guidelines to assist ACAP representatives attending RFMO and other relevant meetings to maximise effective participation and consideration of issues relevant to ACAP	SBWG and others as defined	after AC4	These materials would be defined in the RFMO implementation plan (See 4.3) and be tailored for each RFMO above and beyond those outlined above (AU\$ 30,000). Priority decided inside the RFMO interaction plan.

	Topic/Task	Responsible group	Timeframe	Detail (where relevant, an indicative cost in Australian dollars is given)
4.7	Assist in the preparation, adoption and implementation of FAO NPOA-Seabirds or equivalent	SBWG and Parties/ Range States	Review progress by AC4	Participate in development of FAO Best Practice Guidelines (AU\$ 13,000). Once developed, provide capacity building in accordance with the needs identified by interested parties in order to encourage implementation, in particular in Argentina, Peru, Ecuador, South Africa, (Mozambique, Madagascar), Tristan da Cunha, France, and EC external fisheries.
4.9	Provide and consider annual reports to AC on WG activities	SBWG and AC	AC4, AC5	
4.10	Points from pelagic longline research strategy			
4.11	Points from waved albatross action plan			Likely social influencing programme needing to be planned

TABLES

Each mitigation method was grouped as primary, secondary, or other. Primary measures were those considered likely to be effective without other mitigation measures, and secondary measures were those considered useful for deployment with other measures, but may not significantly reducing bycatch if used in isolation. Side setting, blue-dyed fish and squid bait, and fish oil were regarded as possible candidates for primary mitigation but were considered separately due to their early stage of development and/or limited research results to date. Acoustic alarms, water jets, time-area closures, and artificial lures/bait were not considered. Each was assigned a priority ranking for future research based on the scientific literature and individual experience using the following criteria:

- Effectiveness on surface foraging seabirds
- Effectiveness on diving seabirds
- Practical use on the vessel
- Safe use on the vessel
- Capital Cost – costs for purchase of a specific technology
- Operational Cost – costs related to vessel operations (lost fishing time)
- Applicability to distant water fleets and domestic fleets
- Compliance – the ability to monitor use and performance

Each method was ranked for each criterion on a relative scale of 1 to 5, with 1 being the lowest ranking and 5 being the highest. Considering the ranking for each criterion, each mitigation method was ranked in a similar way resulting in a prioritized list of mitigation methods to focus future research.

Table 2. Review of seabird bycatch mitigation measures for Pelagic Longline Fishing and identification of knowledge gaps

Mitigation measure	Scientific evidence for effectiveness in pelagic fisheries	Caveats /Notes	Need for combination	Research needs	Minimum standards
Night setting	Duckworth 1995; Brothers et al. 1999; Gales et al 1998; Klaer & Polacheck 1998; Brothers et al. 1999; McNamara et al. 1999; Gilman et al. 2005; Baker & Wise 2005.	Less effective during full moon, under intensive deck lighting or in high latitude fisheries in summer. Less effective on nocturnal foragers e.g. White-chinned Petrels (Brothers et al. 1999; Cherel et al. 1996).	Recommend combination with bird scaring lines and/or weighted branch lines	Data on current time of sets by WCPFC fisheries. Effect of night sets on target catch for different fisheries.	Night defined as nautical dark to nautical dawn
Side setting	Brothers & Gilman 2006; Yokota & Kiyota 2006.	Only effective if hooks are sufficiently below the surface by the time they reach the stern of the vessel. In Hawaii, side-setting trials were conducted with bird curtain and 45-60g weighted swivels placed within 0.5m of hooks. Japanese research concludes must be used with other measures (Yokota & Kiyota 2006).	Must be combined with other measures. Successful Hawaii trials use bird curtain plus weighted branch lines. In Southern Hemisphere, strongly recommend use with bird scaring lines until side-setting is tested in the region.	Currently untested in the Southern Ocean against seabird assemblages of diving seabirds and albatrosses - urgent need for research. In Japan, NRIFSF will continue testing in 2007.	In Hawaii, side setting is used in conjunction with a bird curtain and 45 weighted swivel within 1m of the baited hook. Clear definition of side setting is required. Hawaiian definition is a minimum of 1 m forward of the stern.
Single bird scaring line	Imber 1994; Uozumi & Takeuchi 1998; Brothers et al. 1999; Klaer & Polacheck 1998; McNamara et al. 1999; Boggs 2001; CCAMLR 2002; Minami & Kiyota 2004. Melvin 2003.	Effective only when streamers are positioned over sinking baits. In pelagic fisheries, baited hooks are unlikely to sink beyond the diving depths of diving seabirds within the 150 m zone of the bird scaring line, unless combined with other measures such as line weighting or underwater setting. Entanglement with fishing gear can lead to poor compliance by fishers and design issues need to be addressed. In crosswinds, bird scaring line must be deployed from the windward side to be effective.	Effectiveness increased when combined with other measures e.g. weighted branch lines and/or night setting	Optimal design for pelagic fisheries under development: refine to minimise tangling, optimise aerial extent and positioning, and ease hauling/retrieval. Two studies in progress developing optimal bird scaring lines for pelagic fisheries including Washington Sea Grant and Global Guardian Trust in Japan. Controlled studies demonstrating their effectiveness in pelagic fisheries remain very limited.	Current minimum standards for pelagic fisheries are based on CCAMLR Conservation Measure 25-02

Table 2 continued.

Mitigation measure	Scientific evidence for effectiveness in pelagic fisheries	Caveats /Notes	Need for combination	Research needs	Minimum standards
Paired bird scaring lines	Two streamer lines best in crosswinds to maximise protection of baited hooks (Melvin et al. 2004).	Potentially increased likelihood of entanglement - see above. Development of a towed device that keeps gear from crossing surface gear essential to improve adoption and compliance.	Effectiveness will be increased when combined with other measures. Recommend use with weighted branch lines and/or night setting	Development and trialling of paired bird scaring line systems for pelagic fisheries.	Current minimum standards for pelagic fisheries are based on CCAMLR Conservation Measure 25-02
Weighted branch lines	Brothers 1991; Boggs 2001; Sakai et al. 2001; Brothers et al. 2001; Anderson & McArdle 2002; Gilman et al. 2003a; Robertson 2003; Lokkeborg & Robertson 2002, Hu et al. 2005.	Supplementary measure. Weights will shorten but not eliminate the zone behind the vessel in which birds can be caught. Even in demersal fisheries where weights are much heavier, weights must be combined with other mitigation measures (e.g. CCAMLR Conservation Measure 25-02).	Must be combined with other measures e.g. bird scaring lines and/or night setting	Mass and position of weight both affect sink rate. Further research on weighting regimes needed. Testing of safe-leads in progress. Where possible, effect on target catch as well as seabird bycatch should be evaluated. Research on use of integrated-weight branch lines (wire trace) in pelagic fisheries also needs further exploration.	Global minimum standards not yet established. Requirements now vary by fishery and vessel. Hawaii minimum requirements are 45g less than 1 m from hook. Australia requires 60 or 100g located 3.5 or 4 m from the hook, respectively.
Blue dyed bait	Boggs 2001; Brothers 1991; Gilman et al. 2003a; Minami & Kiyota 2001; Minami & Kiyota 2004; Lydon & Starr 2005. Double and Cocking, in press.	New data suggests only effective with squid bait (Double & Cocking). Onboard dyeing requires labour and is difficult under stormy conditions. Results inconsistent across studies.	Must be combined with bird scaring lines or night setting	Need for tests in Southern Ocean.	Mix to standardized colour placard or specify (e.g. use 'Brilliant Blue' food dye (Colour Index 42090, also known as Food Additive number E133) mixed at 0.5% for a minimum of 20 minutes)

Table 2 continued.

Mitigation measure	Scientific evidence for effectiveness in pelagic fisheries	Caveats /Notes	Need for combination	Research needs	Minimum standards
Line shooter	Reduced bycatch of Northern Fulmar in trials of mitigation measures in North Sea, Lokkeborg & Robertson 2002; Lokkeborg 2003. Increased seabird bycatch in Alaska (Melvin et al. 2001).	Supplementary measure. No published data for pelagic fisheries. May enhance hook sink rates in some situations but unlikely to eliminate the zone behind the vessel in which birds can be caught. More data needed. Found ineffective in trials in North Pacific demersal longline fishery (Melvin et al. 2001).	Must be combined with other measures such as night setting and/or bird scaring lines or weighted branch lines	Data needed on effects on hook sink rates in pelagic fisheries.	Not established
Bait caster	Duckworth 1995; Klaer & Polacheck 1998.	Not a mitigation measure unless casting machines are available with the capability to control the distance at which baits are cast. This is necessary to allow accurate delivery of baits under a bird scaring line. Needs more development. Few commercially-available machines have this capability.	Not recommended as a mitigation measure.		
Underwater setting chute	Brothers 1991; Boggs 2001; Gilman et al. 2003a; Gilman et al. 2003b; Sakai et al. 2004; Lawrence et al. 2006.	For pelagic fisheries, existing equipment not yet sturdy enough for large vessels in rough seas. Problems with malfunctions and performance inconsistent (e.g. Gilman et al. 2003a and Australian trials cited in Baker & Wise 2005)	Not recommended for general application	Design problems to overcome	Not yet established

Table 2 continued.

Mitigation measure	Scientific evidence for effectiveness in pelagic fisheries	Caveats /Notes	Need for combination	Research needs	Minimum standards
Management of offal discharge	McNamara et al. 1999; Cherel et al. 1996.	Supplementary measure. Definition essential. Offal attracts birds to vessels and where practical should be eliminated or restricted to discharge when not setting or hauling. Strategic discharge during line setting can increase interactions and should be discouraged. Offal retention and/or incineration may be impractical on small vessels.	Must be combined with other measures.	Further information needed on opportunities and constraints in pelagic fisheries (long and short term).	Not yet established for pelagic fisheries. In CCAMLR demersal fisheries, discharge of offal is prohibited during line setting. During line hauling, storage of waste is encouraged, and if discharged must be discharged on the opposite side of the vessel to the hauling bay.
Thawing bait	Brothers 1991; Duckworth 1995; Klaer & Polacheck; Brothers et al 1999.	Supplementary measure. Must be combined with other measures. If lines are set early morning, full thawing of all bait may create practical difficulties.		Evaluate sink rate of partially thawed bait.	

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Table 4. Research Priorities of Pelagic Longline Nations for Seabird Mitigation Technologies in Pelagic Longline Fisheries. P indicates the need for pilot level research; C indicates the need for comprehensive research. P/C indicated the need for pilot level research followed by comprehensive research when pilot research has a positive outcome. Priorities of individual nations do not constitute a commitment to carry out identified research, but rather indicates strong interest in the research being accomplished and the results of that research for developing best management practices for national fisheries.

	Australia	Chile	NZ	Brazil	Uruguay	South Africa	Peru¹
Streamer lines		P/C	P/C	P/C	P/C	P/C	P ²
Bait Setting Capsules	P/C	P		P	P		
Side Setting	C			P	P		
Weighted Lines/Regimes	C ³		PC			C	P
Bait Pod/Smart Hook	P/C						
Circle Hooks				P/C	P/C	P/C	P
Blue Dyed Squid				P/C	P		
Live vs. Dead Bait	C						
Fish Oil							P
Safe Leads	P		PC	P			
Lightsticks			P				
Night setting			Alt ⁴			P	
Thawed Bait	P						
Alternative Gear for Mahi Mahi				P			P/C

¹ Data collection on extent of bycatch is a high priority.

² Focus on small vessels

³ Includes the effect of line shooters on sink rate

⁴ Alternatives to night setting

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Appendix

MITIGATION MEASURES TO REDUCE SEABIRD BYCATCH

All industrial longline vessels would be required to use at least one of the measures listed below when fishing in the IATTC Area.

Mitigation measures	Description
<i>Side setting</i>	Side setting reduces the seabirds' ability to take the baited hooks.
<i>Night setting with minimum deck lighting</i>	Setting and retrieving the gear at night shifts fishing operations to a time when the seabirds are less active, and reduces the visibility of the bait.
<i>Bird-scaring lines</i>	A system of streamers is deployed to keep seabirds away from the area where the longline enters the water.
<i>Weighted branch lines</i>	Weighted lines sink the baited hooks more rapidly.
<i>Bird curtains</i>	Bird curtains keep the seabirds away from baited hooks.
<i>Blue-dyed bait</i>	Coloring bait reduces contrast with the water, making it more difficult for the seabirds to see.
<i>Underwater setting devices</i>	Devices such as line shooters, underwater chutes, and deep-setting capsules set the baited hooks deep enough to reduce the seabirds' access to the bait; several of these methods are under development.
<i>Management of offal discharge</i>	Fishermen avoid discarding offal while the longline is being set to reduce the attraction by seabirds or used to distract seabirds away from the longline while it is being set.

When fishing within the shaded area shown in Figure A-1, at least two measures would be required. The first must be one of the obligatory measures in section A of Table A-1; the others may be any of the complementary measures in section B of Table A-1 (in combinations marked with an "x").

TABLE A-1. Combinations of mitigation measures to reduce seabird bycatch to be applied when fishing in the shaded areas in Figure A-1

	B. Complementary measures						
	Side setting	Night setting	Bird-scaring lines	Weighted branch lines	Bird curtain	Blue-dyed bait	Offal discharge control
A. Obligatory measures							
<i>Side setting</i>		x	x	x	x	x	x
<i>Night setting with minimum deck lighting</i>	x			x			x
<i>Bird-scaring lines</i>	x			x	x	x	x
<i>Weighted branch lines</i>	x	x	x		x	x	x