OUTCOMES OF ACAP'S SEABIRD BYCATCH WORKING GROUP MEETING

Submitted by Agreement on the Conservation of Albatrosses and Petrels

17 - 18 JUNE 2007

A workshop on Seabird Bycatch Mitigation in Pelagic Longline Fisheries was convened in Valdivia, Chile on 17-18 June 2007 by ACAP's Seabird Bycatch Wokrking Group. 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 a number of seabird avoidance measures have been trialled and proven, there are still many that require rigorous scientific evaluation to determine their suitability.

In order to progress the development of relevant mitigation research, the Working Group reviewed both published and unpublished information available to it. It then commenced on a process designed to develop a plan of research for pelagic longline fisheries, including the identification of specific research experiments, principal investigators, research locations, and possible funding sources.

In light of expert opinion available to it, the Working Group 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 endorsed tables (Tables 1 and 2, Appendix 4) as representing the current best scientific advice and encouraged Parties and RFMOs 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 and RFMOs 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.

Table 1. Assessment of the suitability of pelagic mitigation technologies for future research and application. Rankings have been assigned on a 5 point scale, where 5 is the highest ranking. See below for details of the criteria used for assessment.

Mitigation	Effective surface feeding birds	Effective diving birds	Practical	Safe	Cost Capital	Cost Ops	DWF/ Dom	Compliance	Future Research Priority
Primary									
Streamer lines	4	3	4	4	5	5	5/5	1	5
Weighted branchlines	4	3	5	1	4	4	5/5	5	4
Underwater Setting									
Chute	2	1	2	3	2	5	1/5	1	1
Bait setting capsule	5	4*	4	4	2	5	5/5	3	5
Bait Pod / Smart hooks	5	4*	3	4*	4	4	5/5	1	4
Night Setting	4	3	5	4	5	3*	5/5	3	1
Secondary									
Circle Hooks	?	?	5	5	5	5	5/5	5	4
Bait placement/casting	2*	2*	5	3	4	4	5/5	1	1
Line shooter?	2	2	5	4	4	4	5/5	1	1
Thawed bait	2	2	3	5	5	5	5/5	1	1
Strategic offal discharge	2	2	3	5	5	5	5/5	1	1
Other									
Side Setting	2*	2*	3	4	4	5	5/5	5	5
Blue Dyed Squid	3	3	3	5	5	4	5/5	1	3
Blue Dyed Fish	1	1	3	5	5	4	5/5	1	1

Fish Oil	1	4	2	4	4	3	5/5	1	2

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 wth 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; Uozomi & 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)