INTER-AMERICAN TROPICAL TUNA COMMISSION

SCIENTIFIC ADVISORY COMMITTEE

EIGHTH MEETING

La Jolla, California (USA)

8-12 May 2017

DOCUMENT SAC-08 INF D(d)

Agreement on the Conservation of Albatrosses and Petrels

CURRENT ACAP ADVICE FOR REDUCING THE IMPACT OF PELAGIC LONGLINE FISHING OPERATIONS ON SEABIRDS

Agreement on the Conservation of Albatrosses and Petrels

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SUMMARY

The incidental mortality of seabirds, mostly albatrosses and petrels, in longline fisheries continues to be a serious global concern and was the major reason for the establishment of the Agreement on the Conservation of Albatrosses and Petrels (ACAP). ACAP routinely reviews the scientific literature regarding seabird bycatch mitigation in fisheries, and on the basis of these reviews updates its best practice advice. The most recent review was conducted in May 2016, and this document presents a distillation of that review for the consideration of the IATTC Bycatch Working Group and the IATTC Scientific Advisory Committee. On the basis of the most recent review, ACAP has confirmed that the simultaneous use of weighted branch lines, bird scaring lines and night setting remains the best practice approach to mitigate seabird bycatch in pelagic longline fisheries. Changes to previous advice apply only to the recommended minimum standards for line weighting regimes, now updated to the following configurations: (a) 40 g or greater attached within 0.5 m of the hook; or (b) 60 g or greater attached within 1 m of the hook; or (c) 80 g or greater attached within 2 m of the hook. In addition, following the 2016 review ACAP endorsed the inclusion in the list of best practice mitigation measures of two hook-shielding devices. These devices encase the point and barb of baited hooks until a prescribed depth or immersion time has been reached (set to correspond to a depth beyond the diving range of most seabirds) thus preventing seabirds gaining access to the hook and becoming hooked during line setting. They also provide additional weight, at the hook, on setting. ACAP recognizes that factors such as safety, practicality and the characteristics of the fishery should also be taken into account when considering the efficacy of seabird bycatch mitigation measures and consequently in the development of advice and guidelines on best practice.

1. INTRODUCTION

The incidental mortality of seabirds in pelagic longline fisheries continues to be of serious global concern, especially for threatened albatrosses and petrels. The need for international cooperation in addressing this concern was a major reason for establishing the Agreement on the Conservation of Albatrosses and Petrels (ACAP). In pelagic longline fisheries seabirds are killed when they become hooked or entangled and drowned while foraging for baits on longline hooks as the gear is deployed. Seabirds can also be hooked or entangled as the gear is hauled; however, many of these seabirds can be released alive with careful handling.

The distribution of most albatrosses overlap with pelagic longline fisheries managed by the five tuna Regional Fisheries Management Organisations (tRFMOs), and the adoption and further implementation of best practice seabird conservation measures in these areas and fisheries remains a high priority. ACAP routinely reviews the scientific literature regarding seabird bycatch mitigation in fisheries, and on the basis of these reviews updates its best practice advice. The most recent review was conducted in May 2016 at ACAP's Seabird Bycatch Working Group and Advisory Committee meetings (La Serena, Chile, May 2016), and this document presents a distillation of that review for the consideration of the IATTC Bycatch Working Group and the IATTC Scientific Advisory Committee. The full review document is available in the ACAP website.

ACAP's best practice advice is that the simultaneous use of weighted branch lines, bird scaring lines and night setting is the most effective approach to mitigate seabird bycatch in pelagic longline fisheries (Klaer & Polacheck 1998; Brothers et al. 1999, 2001; Sakai et al. 2001; Anderson & McArdle 2002; Baker & Wise 2005; Gilman et al. 2005; Hu et al. 2005; Melvin et al. 2013; 2014; Jiménez et al. 2009; among others). In its latest (2016) review, minimum standards for line weighting were updated following the presentation and discussion of new scientific evidence. In addition, ACAP endorsed at its 2016 review, the addition of two hook-shielding devices as best practice measures. Such hook-shielding devices encase the point and barb of baited hooks during setting, meeting minimum standards to effectively prevent seabirds becoming hooked during line setting. These hook-shielding devices also act by applying additional weight at the hook on setting, in accordance with line weighting minimum standards. ACAP recognizes that factors such as safety (e.g. recoil of the branch line or 'flyback' incidents), practicality and the characteristics of the fishery should also be considered when assessing the efficacy of bycatch mitigation measures.

The ACAP review process also provides information regarding seabird bycatch mitigation measures that are currently under development or being tested, and which show promise as future best practices in reducing seabird bycatch in pelagic longline fisheries. In order to advise fisheries administrations and decision makers on the best and most effective seabird conservation measures, ACAP will continue to monitor the development of these improving practices and the results of scientific research regarding their effectiveness.

ACAP considers that certain mitigation measures are ineffective, based either on scientific studies, or a lack of evidence in substantiation of claims made about the mitigation measure. A wide range of potential seabird bycatch mitigation measures have been proposed over time; however, not all of these have proven effective. Information about mitigation measures that are not recommended is also provided.

2. BEST PRACTICE MEASURES

ACAP recommends that the most effective way to reduce seabird bycatch in pelagic longline fisheries is to use the following three best practice measures simultaneously:

2.1. Branch line weighting

Branch lines should be weighted to sink the baited hooks rapidly out of the diving range of feeding seabirds. Studies have demonstrated that branch line weighting where there is more mass closer to the hooks, sink most rapidly and consistently (Gianuca et al. 2013; Robertson et al. 2010a; 2013), reduces seabird attacks on baits (Gianuca et al. 2013; Ochi et al. 2013) and seabird mortalities (Jiménez et al. 2013). Studies of a range of weighting regimes, including placing weights at the hook, have shown no negative effect on target catch rates (Jiménez et al. 2013; Robertson et al. 2013; Gianuca et al. 2013).

Increased weighting will shorten but not eliminate the distance behind the vessel in which birds can be caught. Line weighting has been shown to improve the effectiveness of other mitigation methods such as night setting and bird scaring lines, in reducing seabird bycatch (Brothers 1991; Boggs 2001; Sakai et al. 2001; Anderson & McArdle 2002; Gilman et al. 2003a, Hu et al. 2005; Melvin et al. 2013; 2014). Line weighting is integral to the fishing gear and, compared to bird scaring lines and night setting, has the advantage of being more consistently implemented, hence facilitating compliance and port monitoring. On this basis it is important to enhance the priority accorded to line weighting, providing certain pre-conditions can be met, among other things: (a) that the weighting regime is adequately specified; (b) safety issues are adequately addressed; and (c) issues concerning application to artisanal fisheries being taken into account.

On the basis of sink-rate data and seabird attack and bycatch rates, current recommended minimum standards for branch line weighting are as follows (ACAP 2016):

(a) 40 g or greater attached within 0.5 m of the hook; or
(b) 60 g or greater attached within 1 m of the hook; or
(c) 80 g or greater attached within 2 m of the hook.

2.2. Night setting

Setting longlines at night (defined as the time between the end of nautical twilight and before nautical dawn as set out in the Nautical Almanac tables for relevant latitude, local time and date) is highly effective at reducing incidental mortality of seabirds because the majority of vulnerable seabirds are inactive at night. However, night setting is not as effective for crepuscular/ nocturnal foragers (e.g. white-chinned petrels, *Procellaria aequinoctialis*). Consequently, night setting should be used in combination with weighted branch lines and bird scaring lines (Klaer & Polacheck 1998; Brothers et al. 1999; McNamara et al. 1999; Gilman et al. 2005; Baker & Wise 2005; Jiménez et al. 2009; Melvin et al. 2013; 2014). The effectiveness of this measure may be reduced during bright moonlight and when using intense deck lights, and is less practical in high latitudes during summer, when the time between nautical dusk and dawn is limited.

2.3. Bird scaring lines

Bird Scaring Lines (BSLs) should be used in combination with weighted branch lines and night-setting to maximize mitigation success (Uozumi & Takeuchi 1998; CCAMLR 2002; Minami & Kiyota 2004; Melvin 2003). Properly designed and deployed BSLs deter birds from sinking baits, dramatically reducing seabird attacks and related mortalities. A bird scaring line runs from a high point at the stern to a device or mechanism that creates drag at its terminus. Brightly coloured streamers hanging from the aerial extent of the line scare birds from flying to and under the line, preventing them from reaching the baited hooks. It is important to note that the BSLs only provide protection to the baited hooks within the area protected by its aerial extent. This is why it is particularly important to use BSLs in combination with weighted branch lines (and night setting), which ensure that the baited hooks have sunk beneath the diving depth of most seabirds beyond the aerial extent of the BSLs.

BSLs should be the lightest practical strong fine line. Lines should be attached to the vessel with a barrel swivel to minimise rotation of the line from torque created as it is dragged behind the vessel. Long streamers should be attached with a swivel to prevent them from rolling up onto the BSL. Towed objects should be attached at the terminus of the BSL to increase drag. BSLs are at risk of tangling with float lines leading to lost BSLs, interruptions in vessel operations and in some cases lost fishing gear. Adding short streamers to the in-water portion of the line, can enhance drag while minimising tangles with float lines. Weak links (breakaways) should be incorporated into the in-water portion of the line for safety reasons and to minimize operational problems associated with lines becoming tangled.

Given operational differences in pelagic longline fisheries due to vessel size and gear type, specifications of BSLs have been divided into two vessel-size categories: those greater than 35 meters and those less than 35 meters in length.

2.3.1. Bird Scaring Lines for vessels >35 m total length

Simultaneous use of two BSLs, one on each side of the sinking longline, provides maximum protection from bird attacks under different wind conditions (Melvin et al. 2004; 2013; 2014; Sato et al. 2013). The setup for BSLs should be as follows:

- BSLs should be deployed to maximise the aerial extent, which is a function of vessel speed, height of the attachment point to the vessel, drag, and weight of bird scaring line materials.
- To achieve a minimum recommended aerial extent of 100 m, BSLs should be attached to the vessel such that they are suspended from a point a minimum of 8 m above the water at the stern.
- BSLs should contain a mix of brightly coloured long and short streamers placed at intervals of no more than 5 m. Long streamers should be attached to the line with swivels to prevent streamers from wrapping around the line. All long streamers should reach the sea-surface in calm conditions.
- Baited hooks should be deployed within the area bounded by the two BSLs. If using bait-casting machines, they should be adjusted so as to land baited hooks within the area bounded by the BSLs.

If large vessels use only one BSL, it should be deployed windward of the sinking baits. If baited hooks are set outboard of the wake, the BSL attachment point to the vessel should be positioned several meters outboard of the side of the vessel that baits are deployed.

2.3.2. Bird Scaring Lines for vessels <35 m total length

Two designs have been shown to be effective:

1. a design with a mix of long and short streamers, that includes long streamers placed at 5 m intervals over the first 55 m of the BSL, and
2. a design that does not include long streamers. Short streamers (no less than 1 m in length) should be placed at 1 m intervals along the length of the aerial extent.

In all cases, streamers should be brightly colored. To achieve a minimum recommended aerial extent of 75 m, BSLs should be attached to the vessel such that they are suspended from a point a minimum of 7 m above the water at the stern.

ACAP also regards the following as best practice measures:

2.4. Time-Area Closures

The temporary closure of important seabird foraging areas (e.g. areas adjacent to seabird colonies during the breeding season or highly productive waters when large numbers of aggressively feeding seabirds are present) to fishing will eliminate incidental mortality of seabirds in that area. Time-Area closures are highly effective for target locations/seasons but may displace fishing effort into adjacent or other areas which may not be as well regulated, thus leading to increased incidental mortality elsewhere.

2.5. Hook-shielding devices

Hook-shielding devices encase the point and barb of baited hooks to prevent seabird attacks during line setting until a prescribed depth is reached (a minimum of 10 meters), or until after a minimum period of immersion has occurred (a minimum of 10 minutes) that ensures that baited hooks are released beyond the foraging depth of most seabirds. The following performance requirements are used by ACAP to assess the efficacy of hook-shielding devices in reducing seabird bycatch:

(a) The device shields the hook until a prescribed depth of 10 m or immersion time of 10 minutes is reached
(b) The device meets current recommended minimum standards for branch line weighting described in 2.1.1.
(c) Experimental research has been undertaken to allow assessment of the effectiveness, efficiency and practicality of the technology against the ACAP best practice seabird bycatch mitigation criteria (Appendix 1) developed for assessing and recommending best practice advice on seabird bycatch mitigation measures.

Devices assessed as having met the performance requirements listed above will be considered best practice. At this time, the following devices have been assessed as meeting these performance requirements and are therefore considered to represent best practice:

1. ‘Hook Pod’ – 68 g minimum weight that is positioned at the hook, encapsulating the barb and point of the hook during setting, and remains attached until it reaches 10 m in depth, when the hook is released (Sullivan et al. 2016, Barrington 2016a).
2. ‘Smart Tuna Hook’ – 40 g minimum weight that is positioned at the hook, encapsulating the barb and point of the hook during setting, and remains attached for a minimum period of 10 minutes after setting, when the hook is released (Baker et al. 2016, Barrington 2016b)

The assessment of these devices as best practice is conditional on continuing to meet the above performance requirements.

3. OTHER RECOMMENDATIONS

Mainline tension: Setting longlines into propeller turbulence (wake) should be avoided because it slows the sink rates of baited hooks.

Live vs. dead bait: Use of live bait should be avoided. Individual live baits can remain near the water surface for extended periods, thus increasing the likelihood of seabird captures.

Bait hooking position: Baits hooked in either the head (fish), or tail (fish and squid) are recommended because they sink significantly faster than baits hooked in the mid-back (fish) or upper mantle (squid).

Offal and discard discharge management: Offal attracts birds to vessels and where practical should be eliminated, or restricted to periods when not setting or hauling. Strategic discharge of offal during line setting (dumping of offal to the side of the vessel to attract them away from baited hooks) can actually increase interactions between seabirds and baited hooks and should be discouraged. All hooks should be removed and retained on board before discards are discharged from the vessel.

Side-setting with line weighting and bird curtain (North Pacific): Research conducted in the North Pacific indicates that side-setting was more effective than other simultaneously trialed mitigation measures, including setting chutes and blue-dyed bait (Gilman et al., 2003b). It should be noted that these tests were conducted in a single pilot scale trial of 14 days in the Hawaiian pelagic longline fishery for tuna and swordfish with an assemblage of surface-feeding seabirds. This method requires testing in the Southern Ocean with deeper-diving species and at a larger spatial scale, before it can be considered as a recommended approach beyond the pilot fishery. Side-setting must be used in combination with ACAP best practice recommendations for line weighting in order to increase sink rates forward of the vessel’s stern, and hooks should be cast well forward of the setting position, but close to the hull of the vessel, to allow hooks time to sink as far as possible before they reach the stern. Bird curtains, a horizontal pole with vertical streamers, positioned aft of the setting station, may deter birds from flying close to the side of the vessel. The combined use of side-setting, line weighting and a bird curtain should be considered as a single measure.

4. MEASURES UNDER DEVELOPMENT

ACAP supports further development of the following measures:

4.1. Technologies that control depth of release of baited hooks

New technologies that set or release baited hooks at depth (underwater setting device) or disarm hooks to specific depths, thus preventing seabird access to baits, are currently under development and undergoing sea trials.

5. MITIGATION MEASURES THAT ARE NOT RECOMMENDED

ACAP considers that the following measures lack scientific substantiation as technologies or procedures for reducing the impact of pelagic longlines on seabirds:

Line shooters: No experimental evidence of effectiveness in pelagic longline fisheries.

Olfactory deterrents: No evidence of effectiveness in pelagic longline fisheries.

Hook size and design: Changes to hook size and design may reduce the chance of seabird mortality in longline fisheries, but have not been adequately studied.

Blue dyed bait: No experimental evidence of effectiveness in pelagic longline fisheries. Insufficiently researched.

Bait thaw status: No evidence that the thaw status of baits has any effect on the sink rate of baited hooks set on weighted lines.

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APPENDIX 1. ACAP BEST PRACTICE SEABIRD BYCATCH MITIGATION CRITERIA AND DEFINITION

The Eighth Meeting of ACAP's Advisory Committee (2014) endorsed the following definition of Best Practice to be used when developing advice on mitigation measures to reduce seabird bycatch:

i. Individual fishing technologies and techniques should be selected from those shown by experimental research to significantly[1] reduce the rate of seabird incidental mortality[2] to the lowest achievable levels. Experience has shown that experimental research comparing the performance of candidate mitigation technologies to a control of no deterrent, where possible, or to status quo in the fishery, yields definitive results. Analysis of fishery observer data after it has been collected on the relative performance of mitigation approaches are plagued with a myriad of confounding factors. Where a significant relationship is demonstrated between seabird behavior and seabird mortality in a particular system or seabird assemblage, significant reductions in seabird behaviors, such as the rate of seabirds attacking baited hooks, can serve as a proxy for reduced seabird mortality. Ideally, when simultaneous use of fishing technologies and practices is recommended as best practice, research should demonstrate significantly improved performance of the combined measures.

ii. Fishing technologies and techniques, or a combination thereof, shall have clear and proven specifications and minimum performance standards for their deployment and use. Examples would include: specific bird scaring line designs (lengths, streamer length and materials; etc.), number (one vs. two) and deployment specifications (such as aerial extent and timing of deployment), night fishing defined by the time between the end of nautical dusk and start of nautical dawn, and line weighting configurations specifying mass and placement of weights or weighted sections.

iii. Fishing technologies and techniques shall be demonstrated to be practical, cost effective and widely available. Commercial fishing operators are likely to select for seabird bycatch reduction measures and devices that meet these criteria including practical aspects concerning safe fishing practices at sea.

iv. Fishing technologies and techniques should, to the extent practicable, maintain catch rates of target species. This approach should increase the likelihood of acceptance and compliance by fishers.

v. Fishing technologies and techniques should, to the extent practicable not increase the bycatch of other taxa. For example, measures that increase the likelihood of catching other protected species such as sea turtles, sharks and marine mammals, should not be considered best practice (or only so in exceptional circumstances).

vi. Minimum performance standards and methods of ensuring compliance should be provided for fishing technologies and techniques, and should be clearly specified in fishery regulations. Relatively simple methods to check compliance should include, but not be limited to, port inspections of branch lines to determine compliance with branch line weighting, determination of the presence of davits (tori poles) to support bird scaring lines, and inspections of bird scaring lines for conformance with design requirements. Compliance monitoring and reporting should be a high priority for enforcement authorities.

1 Any use of the word 'significant' in this document is meant in the statistical context

2 This may be determined by either a direct reduction in seabird mortality or by reduction in seabird attack rates, as a proxy