

Updated ACAP Advice on Branch line Weighting as a Mitigation Measure to Reducing the Bycatch of Albatrosses and Petrels in IOTC Pelagic Longline Fisheries

Agreement on the Conservation of Albatrosses and Petrels (ACAP)

Abstract

The incidental mortality (bycatch) of seabirds in longline and trawl fisheries continues to be a serious global concern, especially for threatened albatrosses and petrels, resulting in a Conservation Crisis being declared by the Agreement on the Conservation of Albatrosses and Petrels (ACAP) in 2019. There are currently 31 species listed in Annex 1 of the Agreement. Of the 22 species of albatrosses, 17 breed or forage in the IOTC Area, as do four of the nine listed petrel species. The IOTC has recently reviewed the mitigation measures to reduce seabird bycatch and adopted the Resolution 23/07 On Reducing the Incidental Bycatch of Seabirds in Longline Fisheries. This resolution recommended to its Scientific Committee (SC) to develop advice on best practice branch line weighting by 2024 as a mitigation measure to reduce seabird bycatch. ACAP routinely reviews and updates the best practice bycatch mitigation advice for industrial fishing gear types, including pelagic longline. The most recent review took place in August 2024, at the 12th meeting of the Seabird Bycatch Working Group (SBWG12), with updates endorsed by the 14th meeting of ACAP's Advisory Committee (AC14). This paper provides the updates on the review of the minimum standards for the ACAP advice on branch line weighting for pelagic longline fisheries. SBWG12 updated the pelagic longline advice, in particular: (i) to indicate that best practice branch line weighting should achieve a minimum sink rate under experimentally controlled conditions of 0.5 m/s to 5 m depth; (ii) to indicate that when weighting is attached to, or integrated into the hook a minimum of total weight of 50 g will be needed to achieve this sink rate criterion; and (iii) to avoid the use of lead when the lead may be ingested (e.g. attached to or integrated into the hook). The following configurations have been demonstrated, under controlled conditions and with metal materials, to meet this standard: (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. The use of lighting devices or other fishing accessories as weights is not recommended unless they achieve the sink rate criterion. It is advisable that the WPEB consider ACAP's updated recommendations on best practices for branch line weighting when providing the requested advice to the IOTC Commission.

INTRODUCTION

The Agreement on the Conservation of Albatrosses and Petrels (ACAP) provides a framework for coordinating and undertaking international activity to mitigate known threats to albatross and petrel populations. Most species listed in Annex 1 of ACAP have extensive at-sea distributions. The greatest threat to these species is incidental mortality (bycatch) in fisheries (Dias *et al.* 2019, Phillips *et al.* 2016). A global review estimated that at least 160,000 (and potentially in excess of 320,000) seabirds are killed annually in longline fisheries worldwide (Anderson *et al.* 2011). A 2017 risk assessment for pelagic longline fisheries in the Southern Hemisphere indicated very high levels of annual potential fatalities of ACAP species (Abraham *et al.* 2017).

Given the overlap between ACAP species and IOTC fisheries, ACAP cooperates with the IOTC through a [Letter of Intent](#), which was signed in February 2021, replacing an earlier Memorandum of Understanding signed in 2015. ACAP has regularly participated in IOTC meetings and presented updates on ACAP best practice mitigation measures and guidelines, as well as on population status and trends of ACAP species.

Of the 21 species of albatrosses and large petrels that overlap in their distribution with the IOTC Area (see [IOTC-2022-WPEB18-25](#)), ACAP's Population and Conservation Status Working Group (PaCSWG) assessed:

- 11 as *declining* over the last 20 years
- four as *stable*
- two as *unknown*
- four as *increasing*

Further information on the conservation status, population size, and trends of these species can be found in the species assessments (<https://www.acap.aq/resources/acap-species>) developed by ACAP, which also provide comprehensive information on distribution, biology and threats. These will be progressively updated.

The IOTC has recently reviewed the mitigation measures to reduce seabird bycatch. In May 2023, at the 27th Session of the Commission (IOTC S27), the Commission adopted Resolution 23/07 ([Res 23/07](#)) "On Reducing the Incidental Bycatch of Seabirds in Longline Fisheries". This Conservation and Management Measure (CMM) stipulates that in the area south of 25°S, CPCs shall ensure that all longline vessels use at least two of three mitigation measures (night setting, bird scaring lines and branch line weighting) or, alternatively, use hook-shielding devices as a stand-alone measure.

Resolution 23/07 also contained elements that call on the Scientific Committee (SC) to undertake specific tasks. There is a request to the SC that specifies: "(para 8) The Scientific Committee will continue to review and make recommendations to the Commission on advancements and best practice in seabird bycatch mitigation as they become available. This will include, by 2024 at the latest, developing advice to the Commission on best practice branch line weighting."

ACAP routinely reviews and updates the best practice bycatch mitigation advice for industrial fishing gear types, including pelagic longline. This paper provides the updates on the review of the minimum standards for the ACAP advice on branch line weighting for pelagic longline fisheries.

ACAP ADVICE FOR REDUCING BYCATCH OF SEABIRDS IN FISHERIES

Much of the work of ACAP's Seabird Bycatch Working Group (SBWG) focuses on routinely reviewing and updating best practice mitigation advice for industrial fishing gear types (principally pelagic and demersal longline, and trawl gear). The most recent review took place in August 2024, at the 12th meeting of the Seabird Bycatch Working Group (SBWG12), with updates endorsed by the 14th meeting of ACAP's Advisory Committee (AC14). The ACAP review process recognises 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.

SBWG12 reviewed a range of studies that reiterated and further endorsed current best practice advice. 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: (1) branch line weighting, (2) night setting and (3) bird scaring lines. In addition, three hook-shielding devices (the 'Hookpod-LED', the 'Hookpod-mini' and the 'Smart Tuna Hook') and one underwater bait setting device (the 'Underwater Bait Setter, Skadia Technologies') have also been assessed and incorporated into ACAP's Best Practice Advice as alternative stand-alone mitigation measures.

Updated ACAP Advice on Branch line Weighting

The AC14 endorsed the updated review and Best Practice Advice for reducing the impact of pelagic longline fisheries on seabirds recommended by the SBWG12. These updates provide improved clarity and consistency in the document and reflect the latest research presented to SBWG12. These changes include defining a sink rate criterion for best practice branch line weighting and providing further clarification around the use of weight attached to, or integrated into the hook as well as weight materials. These updates to ACAP's pelagic longline mitigation advice document resulted from discussions on two papers presented at SBWG12 ([SBWG12 Doc 09](#) and [SBWG12 Doc 19](#)), as well as from minor amendments made following routine intersessional review ([SBWG12 Doc 07](#)).

[SBWG12 Doc 09](#) (Brothers, 2024) explained why it is logical and appropriate for 50g inclusive of hook weight to be acceptable as a minimum recommended branch line weighting configuration, when the permissible 40 g weight addition up to 0.5 m from the hook might be added at the hook instead. For example, a 50g heavy hook could therefore serve as an alternative branch line weighting option instead of that amount being exceeded if 40 g were to be added at or on the hook. Placing weights on the hook was reported as having the advantage of avoiding any lag in the sink profile of the branch line, compared with weights farther from the hook, and the proposed 50 g heavy hook achieved a sink rate equivalent to the branch line weighting configurations recommended by ACAP. SBWG12 discussed the potential effects of integrating weighting into the hook including: hazards to crew from tear-out flyback events, and risk to vulnerable species, e.g. cetaceans, sharks and marine turtles, when bite-offs occur if lead weighting instead of non-toxic materials were to be integrated into the hook. It was noted that a safety advantage of a heavy hook is that in the case of a bite-off there is no weight to recoil. SBWG discussed recommending against the use of lead when adding weight to the hook and to instead use non-toxic materials partly in order to avoid contamination of human foods. SBWG agreed to update the Best Practice Advice to indicate that hooks with a minimum of total weight of 50 g would meet the sink rate of ACAP recommended branch line weighting configurations, i.e. 0.5 m/s.

[SBWG12 Doc 19](#) (Jiménez *et al.*, 2024) noted that present best practice branch line weighting advice does not consider the materials used in the weighting, which can greatly influence their performance in sinking hooks beyond the reach of seabirds, and that weights of high density and mass, but low volume are preferred. SBWG discussed options to address the issues raised, noting that lights and other accessories are used in some fisheries as an alternative to branch line weighting, and that current ACAP best practice branch line weighting configurations achieved under experimentally controlled conditions a sink rate of 0.5 m/s. SBWG noted that this sink rate helped to ensure that baited hooks reached 5 m depth within the aerial extent of the bird scaring line(s). SBWG agreed to update its guidance to indicate that best practice branch line weighting configurations should be selected from those that have achieved a minimum sink rate of 0.5 m/s to 5 m depth under experimentally controlled conditions and highlight that the use of lights or other accessories are not recommended unless they meet the sink rate criterion.

SBWG updated the pelagic longline advice, in particular:

- i to indicate that best practice branch line weighting should achieve a minimum sink rate under experimentally controlled conditions of 0.5 m/s to 5 m depth, based on [SBWG7 Doc 07](#) (Barrington *et al.*, 2016)
- ii to indicate that when weighting is attached to, or integrated into the hook a minimum of total weight of 50 g will be needed to achieve this sink rate criterion
- iii to avoid the use of lead when the lead may be ingested (e.g. attached to or integrated into the hook).

The use of lighting devices or other fishing accessories as weights is not recommended unless they achieve the sink rate criterion.

Minimum standards for the ACAP advice on branch line weighting for pelagic longline fisheries

Based on this review, current Minimum standards for the ACAP advice on branch line weighting for pelagic longline fisheries reads as follows:

Best practice branch line weighting should achieve a sink rate of 0.5m/s to 5 m depth. The following configurations have been demonstrated, under controlled conditions and with metal materials, to meet this standard:

- 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.

When weighting is attached to, or integrated into the hook, a minimum of total weight of 50 g is sufficient to achieve a sink rate of 0.5 m/s to 5 m depth. Branch 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. It is recommended to avoid the use of lead when the lead may be ingested (e.g. attached to or integrated into the hook). The use of lighting devices or other fishing accessories as weights is not recommended unless they achieve the sink rate criterion.

The full 2024 ACAP review of mitigation measures and Best Practice Advice for pelagic longline fisheries will be made available on the ACAP website by September 2024 (<https://acap.aq/resources/bycatch-mitigation/mitigation-advice>). ACAP has also produced *Advice on Improving Safety when Hauling Branch lines during Pelagic Longline Fishing Operations* (<https://www.acap.aq/resources/bycatch-mitigation/mitigation-advice/3959-acap-2021-pelagic-longlines-safety-when-hauling-bpa/file>).

DISCUSSION AND RECOMMENDATIONS

On July 1, 2024, the previous IOTC Resolution 12/06 (Res 12/06) “On reducing incidental bycatch of seabirds in longline fisheries” was superseded by Res 23/07. Consequently, in areas south of 25 degrees South latitude in the Indian Ocean, CPCs must ensure that all longline vessels use at least two out of the following three mitigation measures: branch line weighting, night setting, and bird scaring lines; or alternatively, use hook-shielding devices as a stand-alone measure. The hook-shielding devices include those listed by ACAP.

As noted in [IOTC-2023-WPEB19-29](#), the mitigation methods detailed in IOTC Res 23/07 are partially aligned with ACAP Best Practice Advice. The use of two out of the three measures (branch line weighting, night setting, and bird scaring lines) is recommended, rather than the simultaneous use of all three. Underwater Bait Setters are not recognized in Res 23/07.

The detailed specification of individual bycatch mitigation options is crucial to their effectiveness and performance. The WPEB should note that among the seabird bycatch mitigation methods stipulated in the IOTC Res 23/07, the branch line weighting specifications are those that show the greatest discrepancy with ACAP advice. This resolution specifies branch line weighting options that have been proven to be less effective at sinking baited hooks beyond the reach of seabirds, in comparison to those recommended by ACAP.

It is advisable that the WPEB consider ACAP's updated recommendations on best practices for branch line weighting when providing the requested advice to the IOTC Commission.

REFERENCES

- Abraham E, MJ Roux, Y Richard, N Walker. 2017. Assessment of the risk of southern hemisphere surface longline fisheries to ACAP species. SBWG8 Doc 07. ACAP Eighth Meeting of the Seabird Bycatch Working Group. 4 – 6 September 2017, Wellington, New Zealand.
- Anderson ORJ, CJ Small, JP Croxall, EK Dunn, BJ Sullivan, O Yates, A Black. 2011. Global seabird bycatch in longline fisheries. *Endangered Species Research* **14**: 91–106.
- Barrington JHS, Robertson G, Candy SG. 2016. Categorising branch line weighting for pelagic longline fishing according to sink rates. [SBWG7 Doc 07](#). ACAP Seventh Meeting of the Seabird Bycatch Working Group. 2 - 4 May 2016, La Serena, Chile.
- Brothers N. 2024. Minimum Weight at the Hook Allowance of 50 g Inclusive of Hook Weight for Pelagic Longlines. [SBWG12 Doc 09](#). ACAP Twelfth Meeting of the Seabird Bycatch Working Group. 5 – 7 August 2024, Lima, Peru.
- Dias MP, Martin R, Pearmain EJ, Bur IJ, Small C, Phillips RA, Yates O, Lascelles B, Garcia P, Croxall JP. 2019. Threats to seabirds: A global assessment. *Biological Conservation* **237**: 525–537.
- Jiménez S, Debski I, Gianuca D, Tierney M. 2024. Minimum standards for the ACAP advice on branch line weighting for pelagic longline fisheries. [SBWG12 Doc 19](#). ACAP Twelfth Meeting of the Seabird Bycatch Working Group. 5 – 7 August 2024, Lima, Peru
- Phillips RA, Gales R, Baker GB, Double MC, Favero M, Quintana F, Tasker ML, Weimerskirch H, Uhart M, Wolfaardt A. 2016. The conservation status and priorities for albatrosses and large petrels. *Biological Conservation* **201**: 169–183.