Agreement on the Conservation of Albatrosses and Petrels

Eleventh Meeting of the Advisory Committee

Florianópolis, Brazil, 13 – 17 May 2019

Report of the Seabird Bycatch Working Group

Seabird Bycatch Working Group

Report of the Ninth Meeting of the Seabird Bycatch Working Group, Florianópolis, Brazil, 6 – 8 May 2019

PURPOSE

This Report documents discussions and recommendations of the Ninth Meeting of the Seabird Bycatch Working Group (SBWG), held in Florianópolis, Brazil, from 6 – 8 May 2019.

1. INTRODUCTION

The SBWG Co-convenor, Anton Wolfaardt, welcomed all SBWG members and observers (**ANNEX 1**) and introduced SBWG's other Co-convenor Igor Debski (New Zealand) and the Vice-convenors, Sebastián Jiménez (Uruguay) and Juan Pablo Seco Pon (Argentina). The Convenor invited all attendees to contribute constructively to the meeting.

2. SBWG MEMBERSHIP

The Convenor reported the addition of three new members to the SBWG since SBWG8: Cristián Suazo, nominated by Chile, Marco Favero, nominated by Argentina, and Megan Tierney, nominated by the UK. The new members were welcomed to SBWG and encouraged to participate actively in its work. Current membership of SBWG is included in **ANNEX 1**.

3. ADOPTION OF THE AGENDA

The Convenor introduced the Agenda and thanked those who had offered to serve as rapporteurs.

4. ACAP BEST PRACTICE SEABIRD BYCATCH MITIGATION CRITERIA AND DEFINITION

The Convenor presented the *ACAP Best Practice Seabird Bycatch Mitigation Criteria and Definition* document to remind SBWG of these criteria and help frame discussions in the following agenda items regarding the development of advice on mitigation measures to reduce seabird bycatch. SBWG agreed that the text in the document outlining the ACAP criteria and definition of best practice should indicate the document is intended to provide guidelines, rather than be prescriptive.

SBWG9 Inf 03 highlighted challenges associated with the current individualised approach to bycatch management regimes, which aim to reduce the mortality of one taxon of conservation concern, but might have unintended impacts on other taxa. A transition to integrated bycatch assessment and management that comprehensively considers biodiversity across its hierarchical manifestations was proposed, where relative risks and conflicts from alternative bycatch management measures were evaluated and accounted for in fisheries decision-making processes.

SBWG noted that the criteria used by ACAP to assess best practice bycatch mitigation considers unintended consequences for other taxa, including species targeted by fishing operations, and those caught unintentionally. Notwithstanding the inclusion of these considerations in the ACAP criteria, SBWG agreed that ACAP should actively collaborate with those working on bycatch management of other taxa towards a co-ordinated approach to bycatch assessment and management. It was suggested that night-setting may potentially increase the bycatch of other taxa, and the Co-convenors encouraged the submission of any evidence of this, along with appropriate recommendations relating to ACAP Best Practice Advice, to the next meeting (SBWG10) for consideration by SBWG. This could include the timing of line-setting at night, and any consequent effects on the catch rates of all taxa.

RECOMMENDATION TO THE ADVISORY COMMITTEE

SBWG recommends that the Advisory Committee:

1. Encourages collaboration by ACAP with organisations working on the reduction of bycatch of other taxa to facilitate a co-ordinated approach to bycatch assessment and management.

5. SEABIRD BYCATCH MITIGATION IN TRAWL FISHERIES

5.1 Review of recent developments in mitigation research and update Best Practice Advice

SBWG9 Doc 25 characterised seabird assemblages attending vessels in the Argentine pelagic trawl fishery targeting anchovy (*Engraulis anchoita*) and analysed their interactions (2011–2013). Shearwaters and Magellanic Penguins (*Spheniscus magellanicus*) were the main by-caught species, followed by Black-browed Albatrosses and White-chinned Petrels. The interactions increased in the presence of fishing discards and during hauling. It was noted that while certification did not strictly require seabird bycatch mitigation, its use is included in the relevant plan of action. Further research is planned in a coordinated way with other bycatch taxa. SBWG recognised the merit of further research on seabird bycatch mitigation in small scale pelagic trawlers.

SBWG9 Inf 15 summarised an industry-led study that developed and tested the effectiveness of two experimental mitigation devices (a baffler and a water sprayer) for trawl vessels in Australia's Commonwealth-managed Southern and Eastern Scalefish and shark fishery. Both experimental mitigation devices showed significant reductions in heavy seabird interactions compared with the pre-existing mitigation measure (pinkies). On stern trawlers, both new devices are deployed at the start of fishing and retrieved at the end of fishing operations, whereas pinkies need to be deployed and retrieved for each shot. This results in time savings and reduced safety risks to crew. SBWG noted the value of collaborating with the industry in this case study and acknowledged the reduction of seabird bycatch that had been achieved. The reporting of any further research to the SBWG was encouraged to allow potential future assessment of these mitigation methods against ACAP best practice criteria.

SBWG9 Inf 20 summarised the outcomes from a workshop conducted on Seabird Cable Strike Mitigation in the U.S. west coast and Alaska Trawl Fisheries which brought together representatives from the groundfish trawl fishing industry, seafood associations, non-governmental organizations, and federal agencies to identify effective and practical mitigation measures to reduce seabird bycatch in the U.S. west coast at-sea hake catcher-processor and Alaska trawl fisheries. SBWG noted the importance of efforts to mitigate interactions between seabirds and net sonde or third wire cables and noted **SBWG9 Inf 08** provided further evidence on the matter**.**

SBWG9 Doc 08 provided proposed amendments to ACAP's trawl advice document reflecting intersessional work to improve the clarity and consistency of the document. SBWG reviewed the changes and identified further improvements. This included the addition of new preambular text to the summary advice to better reflect the variable nature of trawl fisheries. It was noted that a toolbox style of advice for trawl fisheries may be the best way to develop the document in future. With the additional changes made, SBWG adopted the summary advice (see **ANNEX 2**) and tasked the intersessional leads to ensure any resulting changes to the review component of the document be made before the updated version is provided on the ACAP website.

SBWG noted that a number of papers considered at the meeting highlighted the significant threat posed by the use of net monitoring cables used in trawl fisheries and encouraged urgent efforts to address this threat.

The SBWG leads for bycatch mitigation in trawl fisheries are:

- **Amanda Kuepfer and Igor Debksi.**

5.2 Update Mitigation Fact Sheets if required

SBWG noted that there was no need to update the mitigation fact sheets concerning their technical aspects. The new design, layout and wording of the fact sheets were discussed under Agenda Item 22.2.

5.3 Mitigation research priorities

SBWG confirmed the following research areas as the highest priorities for reducing seabird bycatch in trawl fisheries:

i. Options to reduce seabird interactions with cables, in particular net monitoring cables, by manipulating the time, nature and location of offal discharge, as well as engineered alterations or additions to make net monitoring gear less dangerous for birds, recognising size and operational differences between vessels.

ii. Methods and designs to improve efficacy of bird-scaring devices in reducing seabird interactions with trawl gear, particularly with net monitoring cables.

iii. Methods to reduce the entanglement of seabirds in nets during hauling.

iv. Methods that can be applied to various fisheries/seabird assemblages to determine relationships between seabird abundance, cable interactions and mortality (quantifying the level of undetected or cryptic mortality), including the potential to use electronic monitoring of cable strikes.

v. Methods to reduce the entanglement of seabirds in nets during setting, including the applicability of net binding in pelagic fisheries.

vi. Innovative techniques, including water sprayers.

RECOMMENDATIONS TO THE ADVISORY COMMITTEE

SBWG recommends that the Advisory Committee:

1. Endorses the changes to the Summary Best Practice Advice for Reducing the Impact of Pelagic and Demersal Trawl Fisheries on Seabirds (included in **ANNEX 2**).

2. Encourages implementation of the identified research priorities for bycatch mitigation in trawl fisheries identified in Section 5.3.

6. SEABIRD BYCATCH MITIGATION IN DEMERSAL LONGLINE FISHERIES

6.1 Review of recent developments in mitigation research and update Best Practice Advice

SBWG9 Doc 09 provided a summary of ACAP's advice regarding best practice measures for reducing seabird bycatch in demersal longline fisheries, and a review of mitigation measures that have been assessed for these fisheries. The only updates in the document reflected the advice recommended by SBWG8 and adopted by AC10 regarding Bird Scaring Lines for small vessels (≤ 24 m) and the inclusion of text highlighting the advantages of weighting where it is integral to the fishing gear.

SBWG9 Inf 31 presented a seabird bycatch assessment for three Uruguayan fisheries, including two demersal longline fisheries. Seabird bycatch in the demersal longline fishery for Patagonian toothfish was null or negligible, highlighting that implemented mitigation measures were considered adequate. The implementation of night-setting in the Atlantic wreckfish longline fishery resulted in a dramatic reduction of bycatch.

SBWG9 Inf 32 reported on the effect of gear configuration in the South African demersal hake longline fishery on sinking rates of hooks and seabird bycatch rates. Results showed that 40% of the gear is set with floats, especially when targeting *Merluccius paradoxus*.

SBWG noted the scarcity of available studies on the effect of floated demersal longline fisheries on seabirds, particularly ACAP-listed species. SBWG agreed that it would be useful to collate and review all available information on the nature and extent of seabird bycatch associated with floated demersal longlines, and ways to increase the sink rate of this gear.

6.2 Update Mitigation Fact Sheets if required

SBWG noted that there was no requirement to update the mitigation fact sheets in terms of their technical aspects. The new design, layout and wording on the fact sheets were discussed under Agenda Item 22.2.

6.3 Consider priorities for mitigation research

The Working Group recognised that work is ongoing to identify mitigation measures that improve the sink rate of baited hooks on floated longlines and confirmed that this should remain a priority. Parties were encouraged to collaborate on intersessional initiatives to advance this research. Investigation of the effect of using longer buoy lines to increase sink rates, seabird bycatch and fish catch rates, plus the use of line weighting configurations to improve sink rates without jeopardising the fishing gear position at depth were identified as important considerations within the scope of the research priority for this gear type.

The SBWG leads for bycatch mitigation in demersal longline fisheries are:

- **Oli Yates and Anton Wolfaardt.**

RECOMMENDATIONS TO THE ADVISORY COMMITTEE

SBWG recommends that the Advisory Committee:

1. Encourages intersessional work to collate and review available information on the nature and extent of seabird bycatch associated with floated longlines, and ways to increase the sink rate of, or alternative mitigation options for, this gear.

2. Encourages Parties and others to prioritise research to identify mitigation measures that improve the sink rate of baited hooks on floated longlines, and to keep the Working Group informed of developments associated with research on seabird mortality and mitigation in demersal longline fisheries.

7. SEABIRD BYCATCH MITIGATION IN PELAGIC LONGLINE FISHERIES

7.1 Review recent developments in mitigation research and update Best Practice Advice

SBWG9 Inf 31 presented estimates of the total number of seabirds captured by the Uruguayan pelagic longline fishery (2003-2012), based on an analysis of seabird bycatch data in the demersal Patagonian toothfish longline fishery in the Argentinean-Uruguayan Common Fishing Zone and international waters in the southwest Atlantic (2006-2018), and seabird bycatch in the Uruguayan demersal longline fishery for Atlantic wreckfish (2015-2016).

SBWG9 Doc 15 outlined the findings of independent research conducted for ACAP by IMAS/AMC Search on the relative safety of weighted branchlines during simulated flybacks (cut-offs and tear-outs). Under the experimental conditions, the researchers concluded that sliding leads placed within 1 m of the hook or less during a cut-off will slide off the branchline and can be considered safe. However, sliding leads during a tear-out do not always slide off the end of the branchline. During a tear-out, smaller sliding leads represent a potentially more dangerous situation than larger sliding leads. Whole Hookpods were considered to be generally safe as they break into separate parts when they are hit by either the crimp during a cut-off or by the crimp/hook during a tear-out. However, the individual broken parts of the Hookpod can represent a potential hazard. All branchline configurations using weighted

swivels during either a cut-off or a tear-out were considered to be potentially dangerous. It was noted that the trial did not assess the hazard from flyback of hooks on unweighted gear.

It was highlighted that this two-stage project was developed with funds and resources from ACAP, voluntary contributions from Australia, and external funds provided by Abercrombie & Kent Philanthropy (authorized by the Meeting of the Parties), plus the expertise provided by the Australian Maritime College (Hobart, Australia) where the trials were conducted.

SBWG9 Doc 16 Rev 1 considered research into the relative safety of weighted branchlines during simulated flybacks (cut-offs and tear-outs) and developed guidance about ways of improving safety when hauling branchlines during pelagic fishing operations. SBWG noted the importance of ensuring that research findings about flybacks were quickly transformed into practical guidance and fact sheets about improving safety when hauling branchlines during pelagic longline fishing operations. Reference was made to other potential innovations to prevent flybacks and / or make them safer (e.g. buoy with chain). SBWG also referred to the potential effect of thicker diameter end leaders and wire traces in reducing the effectiveness of sliding leads. In addition, wire traces were noted as decreasing the occurrence of cut-offs and increasing the occurrence of tear-outs, potentially increasing the relative hazard during flyback events. It was noted that wire traces can be used as part of a line-weighting strategy. SBWG considered that the research and advice regarding hazards and safety considerations associated with line weighting provides the basis for useful advice to the fishing industry. However, it was also recognised that at some point it becomes a work place safety issue, which is beyond the remit of ACAP.

SBWG9 Doc 17 highlighted the application of branchline weighting as a primary mitigation measure, consistent with a precautionary approach, as branchline weighting is a measure that is most likely to be complied with, and hardest to violate. The document stressed that high levels of non-compliance remain a problem, and that any non-compliance with RFMO seabird conservation measures in authorised vessels needs to be recognised as a form of Illegal Unreported and Unregulated (IUU) fishing. The paper highlighted the importance of appropriate measures to ensure compliance. There was no agreement by SBWG on the proposal for elevating the status of line weighting and/or night-setting as core measures when using the current two out of three approach adopted by RFMOs. This was based on the view, not shared by all SBWG members, that the proposed approach would undermine the three out of three approach in the current ACAP advice. However, as an outcome of the discussions, minor but important revisions to the Best Practice Advice for mitigating bycatch in pelagic longline fisheries were agreed. These may help RFMOs when considering implementation of seabird bycatch mitigation and in assuring compliance, particularly as RFMOs generally require only two out of three mitigation measures to be used. These changes include moving the compliance-related attributes of line-weighting to the section dealing with branchline weighting and adding some information on the ability to monitor compliance of night-setting in the section of the advice dealing with night-setting. The updated version of the summary advice is included in **ANNEX 3.**

SBWG9 Doc 18 detailed an innovative method for detecting night-setting rates using Automatic Identification System (AIS) data. This is the first case study examining night-setting rates using independent data. Results indicated that in areas where seabird mitigation measures are required a maximum of ~15% of sets had less than two hours overlap with daylight. However, the percentage of sets fully compliant with night-setting was likely much lower (<5%). The document recommended that ACAP Parties consider using this method to

monitor their national fleets' night-setting rates using AIS or preferably Vessel Monitoring System (VMS) data, and invited ACAP Parties to collaborate with Global Fishing Watch. SBWG highlighted the merits of innovation to monitor compliance, and the potential of these emerging methodologies. Concerns were expressed by some members about using AIS, which is designed primarily for vessel safety purposes, rather than as a conservation tool. VMS could be also considered since it is primarily used for fishery management purposes.

SBWG9 Inf 17 described the effectiveness in reducing seabird bycatch by setting lines with an underwater bait-setting capsule. Proof of concept experiments in the Uruguayan swordfish fishery showed that baits released 10m underwater eliminated seabird mortality, while baits released 4 m underwater reduced mortality by 87% compared to baitset at the surface. It is hoped that the underwater bait setter will be implemented in a surface longline fishery later in 2019 for operational testing and crew training. The results of the operational trial will be reported to a future meeting of SBWG. SBWG highlighted the value of innovative technologies to reduce bycatch in fisheries.

SBWG9 Inf 16 presented Australia's new Threat Abatement Plan for the incidental catch (or bycatch) of seabirds during oceanic longline fishing operations. The plan provides a national strategy to guide the activities of government, industry and research organisations in abating the impact of this key threatening processes to ultimately achieve zero bycatch of seabirds from longline fishing in Commonwealth fisheries. SBWG noted that the development of Australia's new Threat Abatement Plan was the culmination of several years' work in close cooperation with the fishing industry, scientists with expertise in seabird bycatch and other key government and non-government stakeholders with an interest in seabird conservation.

SBWG9 Inf 01 reported on a workshop convened by the Western Pacific Regional Fishery Management Council to review and discuss causes of increasing seabird catch rates and levels in the Hawaii pelagic longline fisheries. The workshop discussed combinations of mitigation measures and associated research needs to inform options for modifying seabird bycatch mitigation requirements. SBWG recognised the benefits of collaborative processes with fishers in the development, uptake and implementation of seabird bycatch mitigation in fisheries.

SBWG9 Inf 33 reported on progress made with research addressing effectiveness of different designs/ configuration of bird scaring lines. Since only the abstract was submitted, SBWG encouraged the authors to bring a full paper to SBWG10 to allow a comprehensive understanding and discussion about the research.

SBWG9 Inf 34 addressed the question raised at SBWG9 on the use of bait casting machines. The information available through observer debriefings affirmed the proper placing of baits under the areas covered by tori lines, whenever information was available. There was no apparent link between the use of a bait casting machine and any resulting seabird bycatch. It was also clarified that bait casting machines are not considered to be a seabird bycatch mitigation in Japanese pelagic longline fisheries.

7.2 Update Mitigation Fact Sheets if required

This issue was discussed under Agenda 22.2.

7.3 Mitigation research priorities

SBWG confirmed the following mitigation research priorities for pelagic longline fisheries:

Weighted branchlines: carry out further collaborative field research on the relationship between the current ACAP Best Practice Advice concerning line-weighting regimes and resulting seabird mortalities and/ or seabird attack rates, impacts on catch rates of target species, other bycatch species (e.g. sea turtles), and safety aspects associated with using line-weighting. Conduct further research to investigate the effect of the total length of branchlines on sink rates.

Improved branchline weighting for high seas fisheries: develop an experimental branchline with hook sink rates consistent with ACAP's best practice line weighting advice (e.g., 60 g located ≤ 1 m from hooks) in the upper levels of the water column (0–2 m depth). Fast sink rates in the shallow depth ranges are advantageous to seabird conservation and act as a safeguard against any failure to use Bird Scaring Lines or to set by night. An average sink rate of ≥0.4 m/s to 2 m depth should be used to inform the development of the new weighting regime. A single weight, or an improved version of the existing double weight system, might be the operationally preferred weighting option. A multi-disciplinary approach, potentially involving key members of the fishing industry, marine engineers and others as deemed appropriate, is encouraged.

Hook-shielding devices: conduct further field research to evaluate the relative contributions of the sink rate and hook protection components of hook-shielding devices in reducing bycatch, including through entanglements. Research on hook-shielding devices should also investigate their long-term durability or failure rates, and the possibility of increasing the depth (or time) of protection provided. Further research on the effectiveness of the Hookpod-mini (50 g) is encouraged, particularly because the sink rate may vary from the heavier version of the device.

Bird Scaring Lines: developing Bird Scaring Line configuration for smaller vessels and methods that minimize entanglements of the in-water portion of Bird Scaring Lines with longline floats, while creating sufficient drag to maximize aerial extent, remains the highest priority for research on bird-scaring lines. Research activities evaluating the effectiveness of one vs. two Bird Scaring Lines, Bird Scaring Line design features (streamer lengths, configurations, and materials), and methods for efficient retrieval and stowage of Bird Scaring Lines remain research priorities.

Time-of-day: determine the relative effectiveness of Bird Scaring Lines and branchline weighting at night by characterising seabird behaviour at night using thermal or night-vision technologies**.**

Combinations of mitigation measures: evaluate the effectiveness of the simultaneous use of various combinations of two best practice mitigation methods (night-setting, branchline weighting and bird-scaring lines) as called for by existing RFMO seabird conservation measures. Continue to evaluate the effectiveness of the simultaneous use of all three ACAP best practice mitigation measures, including comparative catch rates for the both bycatch and target species.

Novel/Emerging technologies: continue to develop novel and or emerging technologies. At this meeting SBWG identified the following technologies as novel/emerging: underwater bait-

setting capsule, and aspects of vessel design. Also consider innovation in independent monitoring of fishing activities.

Sensory Ecology: encourage and initiate research to examine the sensory capabilities of seabirds (visual, acoustic, olfactory systems) to inform the development of sensory-based safe mitigation technologies and measures as an alternative to trial and error approaches. This research priority has application to the development of mitigation options across a broad range of fishing methods.

Live bird haul capture: investigate the nature and extent of live bird haul capture in pelagic longline fisheries.

Haul mitigation technologies: develop methods that minimise seabird hooking during hook retrieval.

Time/Area Closures: update seabird tracking/fishing effort overlap maps to advance options for time/area management.

Bait-casting machines: Conduct a survey to characterise the extent of use of bait-casting machines, and their operational attributes that may influence seabird bycatch risk.

The SBWG leads for bycatch mitigation in pelagic longline fisheries are:

- **Jonathon Barrington and Sebástian Jiménez**

RECOMMENDATIONS TO THE ADVISORY COMMITTEE

SBWG recommends that the Advisory Committee:

1. Endorses the ACAP advice on improving safety when hauling branchlines during pelagic longline operations (provided in **ANNEX 4**).
2. Endorses the updated review and best practice advice for reducing the impact of pelagic longline fisheries on seabirds related to branchline weighting and night-setting contained in **ANNEX 3**.
3. Encourages implementation of the research priorities identified in Section 7.3 for reducing seabird bycatch associated with pelagic longline gear.

8. SEABIRD BYCATCH MITIGATION IN GILLNET FISHERIES

8.1 Recent developments in mitigation research and priorities for future research

SBWG9 Inf 06 summarised a study assessing the effectiveness of illuminating fishing nets with green light emitting diodes (LEDs) to reduce the incidental capture of seabirds. Experiments were conducted in a small-scale demersal, set gillnet fishery in Peru. This study showed that net illumination reduced seabird bycatch, and, together with previous studies showing reductions in sea turtle bycatch without reducing target catch, indicated potential as a measure for multi-taxa bycatch reduction.

SBWG noted that trials have subsequently been conducted in off-shore Peruvian drift net fisheries showing significant reductions in bycatch for turtles and sea mammals, although reductions in seabird bycatch were not significant.

SBWG9 Inf 29 reported trials conducted in the Baltic Sea to test the effectiveness of high contrast monochrome net panels and net lights (constant green and flashing white LED lights) in reducing seabird (mostly duck) bycatch whilst maintaining fish catch.

The Working Group discussed potential reasons for the differing results between the studies presented, with water clarity and differences in affected species identified as potential causes.

SBWG discussed the relative priority of gillnets to ACAP species. It was noted that at least three ACAP-listed species are currently impacted by this fishing gear, and in future other already impacted species, may be considered as new species for Annex 1 of ACAP. As gillnet mitigation potentially has multi-taxa benefits, the Working Group agreed that ACAP should work together with other organisations (e.g. under existing multilateral agreements) to advance progress in reducing bycatch. SBWG also recommended that a comprehensive literature review of all gillnet mitigation research across taxa be compiled for the next meeting, and that ACAP Parties contribute towards this work, as appropriate.

RECOMMENDATION TO THE ADVISORY COMMITTEE

SBWG recommends that the Advisory Committee:

1. Encourages Parties and others to keep SBWG informed of developments in research on seabird mortality and mitigation in gillnet fisheries, and other relevant information in order to allow future discussion of priority research activities and best practice.

2. Encourages Parties and other to complete a comprehensive literature review of all gillnet mitigation research across taxa before SBWG10.

9. RISKS POSED TO ACAP SPECIES FROM NET FISHING METHODS OTHER THAN GILLNET AND TRAWL

9.1 Assessment of risks and development of ACAP advice, particularly for purse seine fisheries

SBWG9 Doc 26 presented an assessment of seabird bycatch mitigation options in purse seine fisheries. Seabirds involved in such events included ACAP listed species such as the Pink-footed Shearwater, Balearic Shearwater, and the Black-browed Albatross. Six potential measures were identified, including the Modified Purse Seine (MPS) net which has reduced seabird bycatch, as evaluated by the Albatross Task Force in Chile. The document described protocols for handling and rescue of birds specifically for purse seine fishing, in response to incidences of trapped/entangled birds in the final phases of the purse seine haul.

SBWG acknowledged the importance of this advice specific to purse seine fishing and the appropriateness of the toolbox approach (developed for artisanal and small scale fisheries,

see **SBWG9 Doc 21**). It was also noted that efforts should be made to harmonise any safe handling and release guidance that may be appropriate across fishery types (c.f. **SBWG9 Doc 24**). This was further discussed under Agenda Item 22. SBWG noted the timeliness of this research, as some industrial purse seine fisheries are or may soon be seeking certification from bodies such as the Marine Stewardship Council. The Working Group adopted the advice suggested in **SBWG Doc 26**, and recommended a stand-alone advice document be produced including introductory and explanatory text, which should be made available on the ACAP website and provided to both industrial and small scale purse seine fishing operators.

The Working Group encouraged further research across other purse seine fisheries, and encouraged further work developing seabird bycatch mitigation advice for purse seine.

The SBWG leads for keeping the mitigation advice toolbox for purse seine fisheries up to date are:

- **Cristián G. Suazo and Joanna Alfaro-Shigueto.**

The Working Group identified the following aspects of technologies and techniques as research priorities for purse seine mitigation:

i. Deterrents

ii. Physical barriers

iii. Night-setting

iv. Modifications to net design

v. Improved safe release practices if birds are caught

RECOMMENDATIONS TO THE ADVISORY COMMITTEE

SBWG recommends that the Advisory Committee:

1. Endorses the development and dissemination of a stand-alone document for the toolbox advice for reducing the impact of purse seine nets on seabirds (toolbox advice provided in **ANNEX 5**).

2. Encourages implementation of research on purse seine gear mitigation with the following priorities: i) Deterrents; ii) Physical barriers; iii) Night-setting; iv) Modifications to net design; v) Improved safe release practices if birds are caught

10. ARTISANAL AND SMALL-SCALE FISHERIES

10.1 The development of a toolbox template for mitigation advice for artisanal and small-scale fisheries

SBWG9 Doc 21 reported on further work undertaken to develop a toolbox of effective mitigation methods for artisanal and small-scale fisheries. The aim of the toolbox approach is to provide clear and simple advice on the adequacy of each mitigation method for different gear types or fisheries. The main updates to the toolbox since SBWG8 include a revision to the categorisation

to specify if they 1) reduced bycatch of ACAP species, 2) reduced bycatch of other seabird species, 3) reduced bycatch of other marine fauna, 4) are currently undergoing testing, or 5) were tested and showed not to reduce bycatch. Additional mitigation techniques have also been added.

SBWG welcomed the revision of the toolbox template, and the addition of further mitigation techniques. SBWG recommended that the information presented in **SBWG9 Inf 29** on research assessing the efficacy of gillnet modifications (high contrast net panels and net lights) in the Baltic Sea should be added to the toolbox. SBWG recognised the importance of continuing the process of adding new mitigation measures to the toolbox. Given the socio-economic status of many of the fisheries, the cost of and access to mitigation methods, materials and techniques would be a critical factor influencing their uptake.

SBWG agreed that the toolbox of mitigation methods should be made available on the ACAP website, following the inclusion of some explanatory text to describe the context, purpose and use of the toolbox advice, and how it differs from the ACAP advice for industrial fisheries. It was considered that a colour code system could be used to track changes in the status of advice over time.

The SBWG leads for keeping the mitigation advice toolbox for artisanal and small-scale fisheries up to date are:

- **Jeff Mangel and Igor Debski.**

RECOMMENDATIONS TO THE ADVISORY COMMITTEE

SBWG recommends that the Advisory Committee:

1. Endorses the mitigation toolbox providing advice on reducing seabird bycatch in artisanal and small-scale fisheries provided in **ANNEX 6**.
2. Endorses making the toolbox available on the ACAP website following the development and inclusion of introductory text explaining the purpose of the toolbox and its application.
3. Encourages further intersessional work to populate the toolboxes with available information and report back to future meetings.

11. LASER TECHNOLOGY TO MITIGATE SEABIRD BYCATCH

There were no papers submitted for this agenda item, however, SBWG was provided with a verbal update on some of the research that is currently underway.

Research by Dr Esteban Fernandez-Juricic at Purdue University on the risk lasers pose to avian visual systems continues to progress, although delays in processing tissue preparations at a highly specialised pathology lab slowed progress. Testing to date has focused on the pathology effects of laser exposure to house sparrows and European starlings and behavioural effects on house sparrows. Following exposure to laser intensities ranging from 60 to 270 milliwatts and varying exposure times (expressed as energy output which combines

the two) exposed sparrows showed clear signs of injury compared to controls. Exposed birds had much higher probabilities of corneal oedema, cataracts and retinal atrophy. Preliminary analysis suggests no clear power output threshold for damage to occur, which may suggest that any level of exposure can cause injury, but this requires confirmation with larger sample sizes. In behavioural studies, where foraging behaviour was compared before and after exposure, exposed sparrows altered their visual exploration strategy to find millet seeds among plastic beads in a low contrast environment. The birds essentially worked harder using different parts of their retina to find seeds resulting in significant weight loss. Pathology results were more dramatic for exposed European Starlings, suggesting that birds with larger eyes (pupil and lens) may be more susceptible to laser damage. Future tests will explore this possibility.

Recent collaborations with the University of Hawaii and UC Davis have opened an opportunity to work specifically on seabirds. Seabird eye samples were obtained from Hawaii in April 2019 and are about to be examined. Collaborators at UC Davis are poised to receive stranded seabirds as they become available and process eye information with newly acquired sophisticated equipment. Newly acquired equipment will allow testing the characterisation of the visual field of live seabirds. Plans are underway to bring this equipment to Hawaii in the next several months pending funding to support travel expenses.

SBWG welcomed this verbal report and reiterated its serious concern that laser technologies have not been proven to prevent seabird interactions with fishing gear and may pose a significant threat of injury to seabirds and possibly crew. Although this report reinforces this concern and provides preliminary evidence that lasers cause injury in laboratory terrestrial birds, SBWG recognised that work has yet to address the effects on seabirds and there was no paper with specific recommendations for SBWG's consideration. Consistent with the fundamental principle that SBWG take action based on completed science, it refrained from recommending a moratorium on the use of lasers in fisheries, but again recommended a precautionary approach whereby the fishing industry refrain from the operational use of lasers until such time they are proven safe. SBWG considered that it should be the manufacturer's responsibility to demonstrate the safety of these devices prior to marketing them.

RECOMMENDATION TO THE ADVISORY COMMITTEE

SBWG recommends that the Advisory Committee:

1. Encourages Parties and others to keep SBWG informed of developments in research and information on the safety to seabirds and humans of using laser technology as a tool for seabird bycatch mitigation

2. Endorses SBWG's serious concerns regarding bird welfare issues associated with laser technology.

12. DRIVERS AND BARRIERS IN THE UPTAKE OF BEST PRACTICE SEABIRD BYCATCH MITIGATION MEASURES

SBWG8 formally recognised the importance of understanding and addressing the drivers and challenges in the uptake of effective mitigation approaches to reduce seabird bycatch in fisheries, and identified this as a high priority area for ACAP to progress.

Given the length of the discussions under this agenda item, a summary of the main outcomes is provided first, followed by a more detailed account of the discussions.

Summary

SBWG is disappointed that the best practice bycatch mitigation measures have not been used sufficiently extensively to stop the decline of many albatross and petrel species. SBWG considered it sufficiently important to spend considerable time at SBWG9 discussing why there had been insufficient uptake of best practice or even implementation of required bycatch mitigation measures. SBWG acknowledged that many RFMOs and national authorities had put in place at least some measures to reduce seabird bycatch, but that compliance and enforcement were often inadequate. Within jurisdictions where enforcement had occurred, reductions in seabird bycatch were demonstrated, sometimes dramatically so and without the perceived detrimental consequences arising.

Many suggestions related to communication – ACAP is not getting the message across to those in a position to reduce, or to influence the reduction, of bycatch. All communication needs to take full account of the audience that it is aiming to influence. The key recommendations are provided at the end of section 12.

SBWG recognises that understanding the challenges and drivers to the uptake of best practice mitigation is an area of high priority for ACAP. SBWG9 discussed the information in the range of papers presented under this agenda item, recalling the related discussions that arose during the RFMO Engagement Strategy Workshop held on 5 May 2019 (See **ANNEX 7 and 8**). SBWG reviewed and provided feedback about drivers and challenges, and identified additional actions that ACAP could undertake to facilitate the uptake of best practice seabird bycatch mitigation measures by RFMOs. These actions were prioritised and included in a revision to the document prepared by a SBWG intersessional group (**SBWG9 Doc 07 Rev 1**).

All papers submitted under this agenda item were considered in accordance with the recommendations of **SBWG9 Doc 10 Rev 1**. Comments on papers submitted were initially confined to questions clarifying points in the presentation of papers, with more substantive general discussion after all papers had been introduced.

SBWG9 Doc 10 Rev 1, prepared by a SBWG intersessional group, summarised work reviewing the drivers and barriers in the uptake of seabird bycatch mitigation measures and related conservation actions. The paper indicated that without high levels of surveillance and penalties for non-compliance, or incentives to encourage compliance, ACAP advice, or even current bycatch mitigation requirements, are likely to continue to be ignored. Important drivers identified included: compliance processes, fishery certification schemes, ecosystem approaches to fisheries management, mitigation advice focussed on the vessel or fleet rather than generic advice (including consideration of monitoring and compliance), publicity and

engagement and education of fishers. Potential opportunities for ACAP to drive bycatch mitigation were also identified, including engaging with fisheries certification schemes, engaging with RFMOs, expanding the scope of advice, increasing publicity of the consequences of a failure to mitigate seabird bycatch on populations, and engaging with vessel designers to incorporate seabird mitigation in the design phase of new vessel construction.

SBWG welcomed the information about a range of case studies highlighting success stories in the effective implementation of seabird bycatch mitigation. These demonstrated the value of encouraging fishing operators to adhere to mitigation requirements in fisheries, where there is a high level of independent monitoring of fishing operations, and clearly defined negative consequences for non-compliance including the potential risk of a loss of fishing opportunities, reputational damage to the fishery, and for political intervention to occur. SBWG noted that the case studies, which were all of high-value fisheries, highlighted the value of good governance in achieving positive outcomes in the fisheries concerned, and that different approaches may be needed depending on the nature and scale of the fishery concerned, and effectiveness of available governance mechanisms.

SBWG9 Doc 11 provided a case study about lessons learned in seabird conservation in Alaskan longline fisheries. The paper covered over 23 years of fishery observer data (> 0.25 million sets of > 1 billion hooks). The fishing industry collaborated with fishery scientists to identify Bird Scaring Lines as effective mitigation and was proactive in implementing Bird Scaring Lines by adopting them in the fishery two years before they were required by fishery managers. Over the 14-year period following voluntary adoption of bird-scaring lines, mean albatross and non-albatross bycatch rates decreased by 89% and 78%, respectively, saving 10 000 albatrosses and over 130 000 other seabird species over the period analysed. The paper highlighted that: (1) streamer lines alone were an effective seabird mitigation method, (2) night-setting defined by civil twilight increased the catch rates of the fish target catch while reducing the bycatch rates of albatrosses (> 90%) and other seabirds (> 50%) seabirds except Northern Fulmar (*Fulmarus glacialis*), for which rates increased, and (3) a small number of vessels had anomalously high seabird bycatch. Analyses indicated that seabird bycatch was significantly higher for some vessels, while absent in most vessels (67% to 72%), highlighting the value of a prompt, individualised approach to reducing seabird bycatch. The paper concluded that that seabird bycatch reduction measures should be fishery and seabird assemblage specific, and potentially hemisphere-specific, and called for a re-consideration of the definition of night-setting. Seen in this light, ACAP best practices may be more fit for purpose if provided in a toolbox from which to draw upon to respond to the specific circumstances faced in the relevant fisheries.

SBWG recognised the value of incentive-based, collaborative approaches between fishing operators, fishery scientists and policy makers in establishing and refining seabird bycatch mitigation measures. SBWG also noted that application of ACAP best practices would benefit a broad range of affected species and are applicable to most fisheries (particularly where fishing operations occur across one or more ocean basins); there is also benefit in developing species and fisheries-specific mitigation measures in some settings.

Three papers that related to Marine Stewardship Council (MSC) certification were presented to the meeting**. SBWG9 Doc 12** referred to the MSC assessment and management of seabird bycatch in capture fisheries. The paper summarised the MSC assessment scheme and management system for the areas of potential interest to ACAP and recommended that ACAP

take actions to participate in MSC processes, especially the periodic review of bycatch related standards, in order to pursue wider adoption of best practice seabird bycatch mitigation, including compliance verification and reliable bycatch assessment.

SBWG9 Inf 28 reviewed the MSC certification scheme's effectiveness in tackling the bycatch of non-target species. MSC currently certifies 12% of global marine wild catch. The review found the standard does not yet fully ensure that certified fisheries are minimising bycatch. There was inadequate observer coverage in 14 of the 23 the fisheries assessed. Bycatch increased (or did not decrease from high levels) in seven fisheries with only one fishery clearly demonstrating a reduction, although better data collection may be a factor in this result. The paper concluded that ACAP should work with MSC to strengthen the bycatch prevention elements of the MSC standard at the next full Fisheries Standard Review, in order to prevent fisheries with unacceptably high impacts from being certified.

SBWG9 Inf 11 considered the merits of MSC certification schemes in three Argentine fisheries certified under the scheme including opportunities and challenges for seabird conservation. Certifications schemes provide the opportunity to strengthen bycatch considerations in fisheries management. The paper acknowledged that a range of work still needs to be done to adopt effective mitigation measures, discussed a possible ecosystem approach to managing national fisheries, and emphasised the importance of compliance and enforcement.

SBWG9 Inf 04 outlined an approach developed in New Zealand to improve public transparency around mitigation use in fisheries. A Seabird Smart Assurance Scheme was designed to improve or maintain mitigation use through publicly acknowledging the fishers and companies who participate. While the scheme was not implemented, this approach may be worth considering for fisheries where there is public interest in seabird captures.

SBWG9 Inf 19 reported on *Operation Nasse 2018* to inform discussions on the nature of seabird bycatch mitigation currently in use on the high seas. This operation was a Defence monitoring, control and surveillance operation to ensure compliance with Conservation and Management Measure (CMM 2017-06) (aimed at seabird mitigation) of the WCPFC. Twenty-three longline fishing vessels were inspected by New Zealand, although only one was within the area that the measure applied to (southwards of 30°S). Many of the Bird Scaring Lines observed were not satisfactory or compliant for use southwards of 30°S.

SBWG noted the value of using high seas boarding and inspection as an additional method to better understand the degree of compliance with conservation and management measures concerning seabird bycatch mitigation by fishing vessels operating on the high seas under the jurisdiction of RFMOs.

SBWG9 Doc 14 described the at-sea classroom for training and expanding implementation of seabird bycatch mitigation in Chilean and Argentinean trawl fisheries. The project used members of Argentina's Albatross Task Force to deliver at-sea training in cost-effective mitigation measures for trawl fisheries, particularly bird-scaring lines, on a Chilean research vessel. The active participation of crew, observers and captains improved uptake of seabird bycatch mitigation measures. SBWG recognised the value of proactive, at-sea engagement with fishing operators including through at-sea classrooms, when implementing seabird bycatch mitigation in fisheries, as one of a range of collaborative, cost-effective approaches for improving understanding and uptake of mitigation measures by fishers. SBWG acknowledged the contribution of the Albatross Task Force to this work.

SBWG9 Doc 13 reported interviews with small-scale fishers about their experiences and perceptions about non-target taxa conservation in Chile. The researchers found seabirds were viewed positively by the fishers, but sea lions were viewed negatively. They also rated the popularity of a range of potential measures to reduce conflict with these species and recommended that understanding these views and perceptions of fishers is useful for fishery management. SBWG welcomed this research and its use of socio-ecological approaches to better understand the attitude of fishers to the conservation of ecologically related species, and preferences concerning seabird bycatch mitigation measures. This approach helps to identify which seabird bycatch mitigation measures would have a higher degree of uptake within relevant fisheries including small-scale fisheries, especially in the absence of adequate compliance monitoring.

SBWG9 Inf 20 also discussed under Agenda Item 5.1, reported on the US West Coast and Alaska Trawl Fisheries Seabird Cable Strike Mitigation Workshop. Representatives from industry, seafood associations, federal agencies and non-governmental agencies discussed mitigation strategies and agreed on priority physical mitigation measures to be tested by the fleet (including snatch blocks, water deterrents, improving visibility of the net monitoring cable, streamer lines, warp booms and a net monitoring cable float device. The trawl fleet have been voluntarily testing a variety of seabird cable strike mitigation strategies.

In discussing **SBWG9 Doc 18**, which was also presented and discussed under Agenda Item 7.1, SBWG recognised that the use of AIS data collected by Global Fishing Watch's provided an independent source of compliance data which may be used to determine night-setting use at sea, and that VMS data may be more appropriately used for this purpose. ACAP Parties were encouraged to consider using either AIS or VMS data to determine their own night-setting compliance rates, recognising that AIS has been used primarily for safety purposes.

The Co-convenor of the SBWG provided brief feedback on the discussions at, and outcomes arising from, the ACAP RFMO engagement strategy workshop held immediately prior to the SBWG9 meeting. The objective of the workshop was to identify the most effective and efficient ways to engage with the tuna RFMOs (tRFMOs) to deliver on the ACAP seabird conservation objectives, and to identify any changes required to the ACAP RFMO engagement strategy. The issue of drivers and barriers was a key element of the workshop discussions, the outcomes of which are provided in greater detail in section 14 and **ANNEX 8** of this report. SBWG recognised the cross-cutting nature of this agenda item, and encouraged efforts to harmonise approaches across all relevant areas of the work programme.

Overarching discussion on Drivers and Barriers

In the general discussion of this agenda item, concern was expressed over the use of "drivers and barriers" as a phrase and its potential negative connotations –a more neutral/positive phrase for future use would be "enhancing implementation" or "progressing implementation".

Implementation can be enhanced at several scales/stages of the fishery (management) process: e.g. RFMO, national, fishery, fleet, fishing operator, vessel, and crew. Implementation will also overlap between stages and scales. Any communication needs to be tailored to its purpose and target audience. Positive communication and approaches may be more influential than negative (regulatory) approaches, although this may vary with culture. It was noted that socio-ecological analysis might help at all scales, and SBWG recognised it may not have certain expertise necessary to undertake work in this area (e.g. expertise in sociology, anthropology, and communication).

At the RFMO/national/other key fishery influencer levels, suggestions included:

- Reinvigorating information on the conservation crisis affecting albatrosses and petrels- unless the problem is understood and accepted, it will not be solved at all levels and scales.
- Providing information responding to any implementation issues, e.g. cost impacts, implementation timeframes, conflicts of interest, and safety considerations.
- Refining advice highlighting what is new advice, the evidence supporting amending best practices, and progress with implementation.
- Emphasising the importance of implementation and monitoring using positive messaging.
- Engaging with ACAP Parties and others, including during the intersessional periods.
- Exploring partnerships with International Seafood Sustainability Foundation and similar organisations.

Good governance was recognised as critical to success, and that a common challenge was getting the parts of government responsible for conservation to work with those responsible for fisheries management.

At the fishery/fleet/vessel levels, it was noted that seabird bycatch was often fishery (and seabird assemblage) specific and that the effects of a single vessel can be strong in the fleet effects. Good data provided in real time are needed to understand what is happening and to make corrective interventions. Suggestions for improvements included:

- Ensuring language of documents and interventions is understandable to those fishers that ACAP is trying to influence
- Clarifying best practice advice introductory language for the key audience
- Reviewing the format of best practice advice, including considering a toolbox approach to facilitate uptake in particular settings
- Developing positive case studies to highlight successes in effective seabird bycatch mitigation for education, outreach and influencing purposes including, where feasible, information about how many seabirds have been saved
- Employing mechanisms to address high bycatch issues in real time or near real time
- Considering providing rewards for good practice/performance, to showcase success
- Prioritising efforts toward known high risk, high bycatch fisheries

The use of economic drivers was discussed at some length. Certification of fisheries should include full consideration of bycatch, with fisheries that have excessive bycatch not being able to be certified. ACAP should work with all relevant certification standards bodies to ensure bycatch is included and that the relevant ACAP best practice is referred to. An opportunity to influence the MSC standards process is available at present, as the assessment standards are being reviewed and refreshed over the next year. Although only 12% of world landed tonnage is MSC certified, several existing MSC certified fisheries may be having an impact on ACAP-listed species (or may have done so in the past) including. These include seven toothfish fisheries, Chilean austral fleet, Argentine hoki fishery, Namibian hake fishery, and

New Zealand hoki fishery (where bycatch may be increasing at present). In addition, some Asian tuna fisheries are considering or seeking certification at present. SBWG considered that it would be helpful to consider how to engage with certification schemes more broadly, and that the current MSC fishery standards review represents an opportunity to take the first step in this direction.

SBWG suggested that an appropriate mechanism to try to improve the MSC standards would be to task the Secretariat to find a suitable secondee or place a contract to lead the process, working with known experts in this area. A sub-group of SBWG would also be consulted/provide guidance to the lead person(s).

A separate process might be needed to provide comments on future certification processes for individual fisheries. It was suggested that the ACAP Secretariat might register with MSC to receive timely notification of new applications, and to then pass on the notifications to relevant ACAP Parties and/or SBWG members. Other possible options for engagement include serving on the relevant oversight boards.

There was a suggestion to draft a Resolution committing ACAP Parties to implement measures (e.g. ACAP Best Practice) in their nationally managed fisheries so that ACAP Parties could demonstrate leadership on mitigation implementation to RFMOs and other non-ACAP Parties. While there was some support for this, there were also some concerns, recognising that ACAP's strength is in its science-based expertise and careful consideration would be required before taking on a more legal and binding approach.

At a high level, opportunities to influence public opinion, and therefore societal values, to build support behind the need to avoid killing seabirds could include high profile media products, such as programmes narrated by David Attenborough. SBWG was informed that such a programme would be broadcast by the BBC later in 2019. The possibility of establishing an ACAP YouTube channel was mentioned with "how to" videos available.

SBWG also noted that there were frequently insufficient resources among ACAP Parties to implement all of the actions needed to conserve albatrosses and petrels. This was no different from other aspects of fishery management and it was noted that ACAP (at all levels) might make partners or allies, integrate national plans of action and find issues/solutions in common. Working with the fishing industry was recognised as a positive approach, as such collaboration was likely to improve uptake of seabird bycatch mitigation measures.

RECOMMENDATIONS TO THE ADVISORY COMMITTEE

SBWG recommends that the Advisory Committee endorse the recommendations developed by SBWG9 for enhancing the implementation of measures to reduce seabird bycatch. These are grouped into three main areas:

1. Developing a **communication strategy** and **communication products** that highlight:
    - The ongoing conservation crisis
    - Best practice fishing methods (perhaps by providing a toolbox of best practices)
    - Success stories
    - Overcoming impediments to implementation

- Other information resources available from ACAP
- Modelling the extinction threat faced by ACAP species

2. Engaging with certification schemes initially by contributing to the current review of MSC fisheries standards to strengthen bycatch considerations.

3. Requesting that the ACAP Secretariat registers with MSC and other relevant fishery certification schemes to get notified of new applications and to then pass on notifications to relevant ACAP Parties and/or SBWG members.

4. Investigating opportunities to broaden the range of expertise available to ACAP to contribute to future considerations in this area, including media and socio-economic experts.

13. ACAP PERFORMANCE INDICATORS: SEABIRD BYCATCH

13.1 Review of intersessional work to further develop bycatch indicators and a reporting framework for ACAP, and a review the information submitted to the reporting framework

SBWG9 Doc 05 provided an update on intersessional on developing ACAP seabird bycatch indicators and a reporting framework. The Secretariat has made a number of improvements to the presentation of the bycatch forms in the ACAP database. Although some Parties and Range States engaged with this new format, as part of the AC11 reporting round, overall the review of existing data and submission of new data was very limited. The low level of reporting prevented any further analyses to progress indicator development and implementation.

SBWG reiterated the importance of this reporting as part of the Agreement's work, which has been endorsed by the AC and the MoP, noting that information about records of zero bycatch in any fisheries of relevance was also sought. Data holders were reminded that data maybe submitted at any time prior to the annual AC reporting round. The importance of these data to the wider conservation community was also highlighted. Parties were encouraged to provide data diligently.

Several SBWG members indicated that despite the challenges of insufficient resources, complexities of fisheries and the need for coordination with different agencies or bodies, their Party remains committed to submitting bycatch data and relevant fisheries information. Appreciation was also expressed for data contributed by non-Parties.

SBWG discussed the need to make data reporting a priority for the relevant agencies so that resources for this task are made available internally, and explored other mechanisms available to the Agreement to emphasise the importance of this work, such as potentially through binding MoP resolutions.

SBWG9 Doc 06 provided draft ACAP Conservation Guidelines on data collection for observer programmes to improve knowledge of fishery impacts on ACAP-listed species. It was proposed these guidelines, once adopted, be promoted to ACAP Parties, RFMOs and others to facilitate developing targeted data collection protocols where needed.

SBWG commended the authors on the document, and provided feedback on further improvements that could be made to the guidelines. Several SBWG members offered to complete the updates intersessionally and provide a revised document to SBWG10. SBWG agreed that while this review is taking place, **SBWG9 Doc 06** maybe referred to in the interim, if needed when engaging with RFMOs and others on this topic.

SBWG9 Inf 26 Rev 1 presented a review of the levels of observer coverage required to estimate and monitor seabirds and other endangered, threatened and protected (ETP) species both commonly and rarely bycaught in pelagic longline fisheries. Coverage levels of 5 – 10% do not provide for a robust understanding of the nature and extent of ETP bycatch and the 5% minimum observer coverage is often not met by tRFMO member States. Increasing required coverage levels to 20% of fishing effort would be a pragmatic step forward, though higher levels should be targeted. In cases where relevant States are not yet meeting tRFMO coverage requirements, addressing the barriers to implementation is urgent and critical. Alongside improving coverage by human observers, the paper recommended that tRFMOs continue to integrate electronic monitoring into their monitoring frameworks.

SBWG noted that the challenges of adequate observer coverage are universally acknowledged and are the subject of ongoing discussions by RFMOs. It concurred that electronic monitoring has a role to play in addressing the capacity issues involved.

RECOMMENDATION TO THE ADVISORY COMMITTEE

SBWG recommends that the Advisory Committee:

1. Re-iterates the importance of bycatch data being made available to progress the work on indicators and urges all ACAP Parties and collaborating Range States to use the reporting template to provide bycatch information as soon as possible.
2. Supports intersessional work to complete the data collection guidelines for observer programmes before the dissemination of this advice.

14. CO-ORDINATION OF ACTIVITIES RELATING TO RFMOS

14.1 Feedback on and update of RFMO engagement strategy

The Co-convenor provided a brief report on the ACAP RFMO engagement strategy workshop that took place immediately prior to SBWG9 on 5 May 2019. The agenda for the workshop is provided in **ANNEX 7**, and a more detailed report in **ANNEX 8**. The objective of the workshop was to identify the most effective and efficient ways to engage with tRFMOs to deliver on the ACAP seabird conservation objectives, and to identify any changes required to the ACAP RFMO engagement strategy.

RFMOs are critically important to ACAP due to high overlap of fishing effort with many ACAP species, including a high proportion from high priority populations, and as they provide an important opportunity for ACAP to engage with key relevant fisheries and nations. Fundamental to ACAP's aims is that bycatch needs to be understood and accepted as a problem by tRFMOs, fishing nations, and fishers. The adoption of Conservation and

Management Measurements for seabirds in the tRFMOs demonstrates some acceptance of the issue in the past. However, the workshop participants highlighted the need to reinvigorate information on the current crisis in albatross conservation, and why and how it should be solved, especially in light of continued bycatch threats. Unless the problem is understood and accepted, it will not be solved. In this respect, ACAP should be developing new messaging to help achieve this aim. This should make use of case studies to highlight the problems and solutions, as well as simulation studies to show clearly the consequences of bycatch for affected populations. These should include the use of ACAP High Priority Populations.

Compliance with required seabird bycatch mitigation measures is an area that the workshop participants considered needed much greater attention. It was acknowledged that this is a difficult area in which to engage, but that ACAP and ACAP Parties should be looking to assist where it can to provide ideas on how to monitor and improve compliance, including through the development of innovative methods. The importance of adopting a collaborative approach between ACAP, ACAP Parties and participating non-ACAP Parties in progressing bycatch reductions in the RFMOs was highlighted. This approach should include intersessional interactions and encouraging relevant RFMO Members to take the lead on conservation proposals with ACAP providing a supporting role. It was recommended that ACAP should also collaborate more closely with organisations working on bycatch of other taxa, to create a more coordinated and harmonised approach to bycatch assessment and management in the RFMOs.

SBWG9 Doc 07 provided a review of the 2017-2019 framework for ACAP's engagement strategy with RFMOs and CCAMLR, and listed priority actions for the period 2019–2021. **SBWG9 Doc 07 Rev 1** incorporated amendments flowing from the discussions at the ACAP RFMO engagement strategy workshop, including revised actions for the 2019-2021 period.

SBWG supported the actions in **SBWG9 Doc 07 Rev 1**, and recommended the following areas in which the document and engagement strategy could be improved:

- Changing the structure of the RFMO engagement strategy document from a tabular format to one that provides clearer identification of priority actions.
- Re-ordering the themes in Table 1 to reflect the greater priority of implementation issues over updates to regulations.
- Including summaries of the feedback (reports) from the ACAP Secretariat to the SBWG on meetings that they have attended, and the main outcomes and next steps.

SBWG noted the value of ACAP engaging with RFMOs and CCAMLR, and also highlighted the importance of engaging with ACAP Parties about fisheries in national jurisdictional waters. The ACAP RFMO and CCAMLR engagement strategy would benefit if the ACAP Parties set an example for RFMOs and CCAMLR to follow. SBWG also recommended that the Advisory Committee discuss mechanisms to facilitate productive collaborations and coordination between ACAP Parties and collaborating Range States that are members of a particular RFMO and CCAMLR in the work of those bodies.

Noting the list of future potential activities in Table 1 of **SBWG9 Doc 07 Rev 1**, and the discussions reported above, SBWG agreed that the key areas for engagement with RFMOs remain the following:

1. Strengthen implementation of RFMO and CCAMLR seabird conservation measures (including the promotion of the ACAP best practice guidance).

2. Strengthen RFMO and CCAMLR bycatch data collection and reporting requirements, and the inclusion of appropriate seabird bycatch mitigation elements within RFMO and CCAMLR compliance monitoring. Focus ACAP inputs through the development of specific ACAP products (for example, advice on seabird bycatch indicators, seabird elements of electronic monitoring)
3. Engage in RFMO and CCAMLR reviews of seabird measures.

The proposed actions from Table 1 of **SBWG9 Doc 07 Rev 1** have been grouped according to these three areas and are presented in **ANNEX 9.**

RECOMMENDATIONS TO THE ADVISORY COMMITTEE

SBWG recommends that the Advisory Committee:

1. Supports implementation of the prioritised key areas for engagement with RFMOs and CCAMLR, as identified in **ANNEX 9**, and provides the resources necessary to achieve this.
2. Discusses approaches for ACAP Parties and collaborating Range States to collaborate and coordinate efforts at RFMOs and CCAMLR, including during intersessional periods, and between RFMOs and CCAMLR.

15. ELECTRONIC MONITORING

15.1 Development of advice for the use of Electronic Monitoring in relation to seabird bycatch

SBWG9 Inf 02 summarised methods to increase the functionalities and accuracy of e-monitoring in fisheries.

SBWG9 Inf 07 considered the merits of Electronic Monitoring (EM) as a potential alternative to on-board observers in small-scale fisheries in Peru. The performance of this method was compared to on-board observer reports and while cameras were shown to be an effective tool for identifying catch, detection rates of bycatch were more variable.

SBWG9 Inf 21 outlined a proof of concept to identify seabird species identification as part of EM. For a machine learning system, birds collected for necropsy were presented to imaging cameras. Overall accuracy was 93%, with some species (Black-footed and Laysan Albatross) at 100% accuracy. Following these favourable results, further research, development, and testing will be conducted.

SBWG recognised the need for ongoing innovation in EM, including ensuring effective implementation of the technology in small-scale fisheries. SBWG noted that EM has a dual role in monitoring fishing operations, as well as for compliance purposes through integration with other technologies. SBWG noted that machine learning systems offer considerable promise in the cost-effective application of e-monitoring systems, particularly as the scope and scale of the use of e-monitoring increases globally. This work is ongoing and continues to be based on extensive collaboration involving many stakeholders.

SBWG recalled the existing ACAP advice on EM concerning seabird bycatch and encouraged the further development of this advice into a guideline document for use by ACAP Parties and others to encourage including seabird bycatch objectives within EM initiatives. This work remains outstanding and SBWG recommended that it be progressed intersessionally. SBWG recommended that this approach should build on the recommendations (i–viii) endorsed by AC9:

i. The design of EM systems, and procedures governing the deployment of these systems, should ensure imagery is collected and stored in a manner that avoids external tampering and provides safe storage for subsequent review, and that analysis of the imagery is undertaken by independent reviewers.

ii. EM systems should collect fine scale data about the day, time, and location of deployment and retrieval of fishing gear.

iii. EM systems should provide imagery of a clear view of the fishing gear as it is set and retrieved and all setting and hauling events should be recorded by the system.

iv. Imagery gathered by EM systems should be independently reviewed so that the programme and all aspects being monitored can be considered transparent and robust.

v. EM systems should provide imagery that results in a clear and unobstructed view of any mitigation measures required by regulatory bodies and footage should be independently reviewed to verify that the mitigation is being deployed in accordance with specifications.

vi. Seabirds brought onboard the vessel alive should be handled in accordance with ACAP's '*Hook Removal from Seabirds*' advice.

vii. Protocols for the identification of seabirds to species level should be developed and applied, where practicable. Such protocols may include, but should not be limited to, retaining the carcass or a sample of the feather or muscle for post-trip analysis. The protocol should incorporate those detailed in ACAP's '*Seabird Bycatch Identification Guide'* where relevant.

viii. Ideally, development of EM systems should include a pre-implementation phase in which stakeholders work together to address challenges for implementation, as well as a process for providing feedback on implementation.

RECOMMENDATION TO THE ADVISORY COMMITTEE

SBWG recommends that the Advisory Committee:

1. Supports the planned intersessional work on further developing best practice guidelines for using electronic monitoring in relation to seabird bycatch, and encourages Parties and others to participate in this work.

16. RISK ASSESSMENT

16.1 New bycatch information for species/fisheries, including overlap of seabirds and fishing effort

SBWG9 Doc 20 used observations at colonies to assess live-capture rates of seabirds in fisheries, and subsequent survival. Counts of foul-hooked birds at the colony provided an indication of relative risk of live-capture for different albatross and petrel species over time, reflected changes in fisheries practices, and are potentially a useful adjunct to vessel-based monitoring of live-capture rates. Taking into account age and status of ringed Wandering Albatrosses reported as live-caught, subsequent survival rate was one third to one half of that expected for the wider population. As live-caught seabirds typically represent >10% of those brought on board, a reduction in survival of this magnitude has important implications for assessing impacts of fisheries on seabirds generally.

SBWG9 Doc 19 described an experiment undertaken to assess 'cryptic mortality', the proportion of seabirds caught and subsequently lost from longline hooks during a commercial pelagic fishing operation. Seabird 'surrogates' -euthanized domestic ducks - were manually attached to longline hooks during a typical pelagic longline 'tuna set' conducted on a longline vessel fishing in New Zealand. Results showed an almost complete retention of birds hooked during the experiment. Of the recovered branchlines on which a duck was deployed only 1.54%, 1.56 % and 9.35% were missing for bill, throat, and wing hooked birds, respectively. SBWG considered that there may be a number of factors influencing the retention of birds on longlines. These included the struggling of and fighting between live caught birds, the speed of the vessel and the consequent drag forces which may not be the same as that experienced by the ducks used in the study reported in **SBWG9 Doc 19**.

SBWG noted that **SBWG9 Doc 20** and **SBWG9 Doc 19** highlight: i) the importance of taking cryptic mortality into account in ecological risk assessments and other approaches assessing impact of fisheries bycatch on seabird populations; ii) the demonstration of a new method (**SBWG9 Doc 20**) in which relevant data on survival of live-capture seabirds can be utilised in bycatch assessments; and iii) the continued challenges of being able to definitively define appropriate scalers for cryptic mortality. SBWG encouraged ACAP Parties to consider further research on this important issue with a focus on how information from this and other cryptic mortality studies can be used to incorporate a level of confidence into cryptic mortality estimates and risk assessments. It was noted that while ACAP promotes the inclusion of cryptic mortality estimates in risk assessments, ACAP does not specify the use of a specific cryptic mortality scaler due to the inherent variability in such estimates. Differences in estimates are likely related to factors such as type of fishing gear used, type of seabird interaction with gear, and factors that affect retention time of bycaught seabirds, if hooked (e.g. drag coefficients, predation by other species etc.).

SBWG9 Inf 22 presented seabird bycatch estimates for the Namibian demersal trawl and demersal longline fleets before and after regulations requiring the use of Bird Scaring Lines were introduced to mitigate seabird mortalities. In the demersal longline fleet, there was a 95% reduction in bycatch rate compared to the pre-regulation period. No significant difference was found between pre- and post-regulation bycatch rates in the demersal trawl fleet. Compliance with regulations remains an issue on trawl vessels concerning the timing of BSL deployment.

SBWG congratulated all those involved in the work in Namibia, which has resulted in such a significant reduction in seabird bycatch in the Namibian demersal longline fishery. The ATF, BirdLife and Namibian partners would welcome any advice from SBWG on how they may address the non-compliance issues within the demersal trawl fishery. Offers were made from the Argentine ATF team to collaborate and exchange knowledge and ideas with the Namibian team to find a solution. SBWG highlighted the value of promoting the achievements made in Namibia concerning the number of birds which will now be saved each year (tens of thousands of birds) and the collaborative nature of SBWG members and of Parties working together are very powerful, positive messages which should be promoted. The Namibian representative noted that while sanctions had not yet been implemented regarding the non-compliance issues, non-compliance reports have been submitted by the Namibian Fisheries observer agency to the Fisheries Directorate. It was also noted that the Namibian Government plans to take on the responsibility of data collection on seabird bycatch and mitigation compliance, which is currently handled by the ATF on their behalf, and to independently report on seabird bycatch, as stipulated in the Namibian NPOA-S, which was recently finalised. SBWG welcomed this further positive step forward in responsible seabird bycatch mitigation management in Namibia.

SBWG9 Inf 23 presented new information on the current levels and seasonal variation of seabird bycatch rates in dolphinfish and handline fisheries off south-southeastern Brazil, obtained via interviews and on-board observation. Considering the bycatch rates and the huge total fishing effort of both dolphinfish longline and tuna handline fleets, the total bycatch mortality in these fisheries represents a potential unaccounted threat to a number of seabird species already killed by pelagic longline fisheries in the southwestern Atlantic.

SBWG welcomed this paper and the new information it presents on seabird bycatch estimates from a very large fishery, which previously had no such data reported. It was noted that this fishery could have a significant impact on the population of Atlantic Yellow-nosed Albatross from Tristan da Cunha, an ACAP Priority Population. The SBWG emphasised the importance of getting a better understanding of the bycatch risk to Atlantic Yellow-nosed Albatross in this fishery and encouraged continued efforts to engage with the fishery to address seabird bycatch issues.

SBWG9 Inf 24 reported the results from assessment of efficacy of Bird Scaring Lines as a mitigation measure to reduce seabird mortality on trawl warp and net monitoring cables in factory trawl vessels using both bottom and midwater trawls to target hoki, southern blue whiting and Patagonian toothfish along the southern tip of the Argentine Patagonian Shelf. The use of BSLs resulted in a significant decline in the number of collisions by seabirds with both cables. Where a combination of no discarding and BSLs were used together, interactions were reduced to almost zero, lending further support for ACAP's advice for reducing bycatch in trawl fisheries.

SBWG9 Inf 08 described the risk assessment of trawl and longline fisheries related to ACAP listed seabird species in Chile as the outcome of a secondment (supported in part by ACAP) of a Chilean researcher in New Zealand. Results showed the potential annual mortality (by Chilean longline and trawl fisheries operating south of 40°S) and the associated demographic impact risk for 16 seabird species listed by ACAP.

SBWG noted that **SBWG9 Inf 24** and **SBWG9 Inf 08** both showed continued evidence that collision of seabirds with net monitoring cables as a primary cause of seabird mortality in trawl fisheries, and that the implementation of ACAP mitigation measures such as Bird Scaring Lines and discard management can significantly reduce these interactions. The tension between the employment of safe and successful fishing techniques on the one hand, and the minimisation of the impact of fisheries on non-target species on the other hand, can be a major barrier to the uptake and implementation of best practices in seabird bycatch mitigation measures (see also Agenda Item 12). In the case of **SBWG Inf 24**, some operators showed reluctance to adopt alternatives due to the advantages net monitoring cables have in terms of enabling greater and more immediate manoeuvrability of the net compared with just using the warp cables. Parties are encouraged to continue with efforts when engaging with fisheries to promote alternate mitigation measures to Bird Scaring Lines, such as the use of snatch blocks when net monitoring cables are used.

SBWG noted that **SBWG9 Inf 08** was important in establishing bycatch estimates for the trawl fishery in Chile. SBWG also welcomed news of the bycatch mitigation regulations for the fishery that should come into effect in the second half of 2019. SBWG recommended caution when using cryptic mortality estimate multipliers, such as that used in **SBWG9 Inf 08**. The figures reported for Black-browed Albatrosses would result in unsustainable population estimates, but this is not reflected in population trends. The authors were encouraged to revise the model as well as to confirm the identity of some bycaught species. SBWG acknowledged that this fishery is likely to be causing significant mortality of ACAP species and SBWG were reminded that there are mechanisms within ACAP to identify priority fisheries. Chile was urged to report on this fishery so that SBWG can make appropriate recommendations.

SBWG9 Inf 30 assessed the capture and incidental mortality of seabirds in the artisanal and purse seine fleets for sardine, anchoveta and horse mackerel operating in south-central Chile during 2015-2017. The highest levels of capture and incidental mortality were observed in the industrial and artisanal fleets targeting sardine and anchoveta and included the ACAP-listed species Pink-footed Shearwater. Work is continuing to estimate total mortality, taking into account a variety of factors, primarily distribution of fleets and observation coverage.

SBWG welcomed this paper, particularly new information on bycaught Pink-footed Shearwaters in these fisheries. It was noted that this information will be particularly helpful to both Peru and Chile in supporting further work to implement bycatch mitigation measures, and in potential use in MSC certification assessments.

SBWG9 Inf 31 assessed seabird bycatch in Uruguayan longline fisheries. In the pelagic longline fleet (2003-2012) bycatch numbers were in the order of a hundred birds per year. No fishing effort was deployed after 2013, but effective mitigation measures tested onboard are available in case this fleet resumes its activity. The bycatch in the demersal longline fishery for Patagonian toothfish is null or negligible, highlighting that mitigation measures are adequate. Bycatch of the demersal longline fishery for Atlantic wreckfish (2015-2016) was dramatically reduced by the introduction of night-setting after a few events of bycatch recorded during the first observed fishing trip.

SBWG Doc 25 was presented and discussed under Agenda item 5.1, but was also considered as part of this agenda item.

PaCSWG5 Inf 19 analysed tracking data from juvenile Grey-headed Albatrosses which fledged from Bird Island, South Georgia (Islas Georgias del Sur)[1] in 2018, and compared their distribution to that of adults from the same colony. Juvenile Grey-headed Albatrosses overlapped mostly with the Japanese fleet in April-June in the central Atlantic Ocean around Tristan da Cunha, and adults with the fleet of Chinese Taipei in July-September in the Pacific Ocean. The high overlap of juvenile Grey-headed Albatrosses with fisheries operating east of Tristan da Cunha coincides with a bycatch hotspot previously reported by the Japanese observer programme. These results highlight the importance of reducing bycatch in the pelagic longline fleets of Chinese Taipei and Japan in reducing the threat to this ACAP Priority Population and to other ACAP listed species.

SBWG9 Inf 05 assessed the drivers of dramatic changes in the albatross community at South Georgia (Islas Georgias del Sur)[1] including globally important populations of three species that have declined by 40–60% over the last 35 years. There was evidence of two kinds of combined environmental and anthropogenic effects. The first was sequential: in Wandering and Black-browed Albatrosses, high levels of bycatch have reduced juvenile and adult survival, then increased temperature, reduced sea-ice cover, and stronger winds are affecting the population recovery potential. The second was additive: in Grey-headed Albatrosses, not only did bycatch impact adult survival, but also this impact was exacerbated by lower food availability in years following El Niño events. These effects emphasize the need for much improved implementation of mitigation measures in fisheries and better enforcement of compliance.

SBWG9 Inf 18 used a comprehensive biologging dataset spanning all major life-history stages to assess spatial overlap of four threatened seabird populations from South Georgia (Islas Georgias del Sur)[1], with longline and trawl fisheries in the Southern Ocean. **SBWG9 Inf 18** also provided a framework for calculating appropriately-weighted population-level distributions from biologging data, which the authors recommend for future fisheries bycatch risk assessments. Many regions of high spatial overlap corresponded with high seabird bycatch rates recorded by on-board observers, indicating that the approach reliably mapped relative bycatch risk at large spatial scales.

PaCSWG5 Inf 14 reported on the Ocean Sentinel programme that was carried out between December 2018 and June 2019 to improve knowledge on the fine scale interactions between Wandering and Amsterdam Albatrosses and fisheries operating in the Southern Indian Ocean, and examine the possibility of using birds fitted with new generation loggers recording location and radar emissions as indicators of the presence of fishing boats. The initial analyses from the programme indicate that Ocean Sentinel was able to provide instantaneous information on the location of vessels, including those switching off their AIS. Present analyses are comparing the efficiency of Ocean Sentinel to detect operating fishing vessels via the AIS, VMS and RADARSAT systems.

SBWG9 Inf 10 provided an overview of the status of the certification schemes implemented in three Argentine fisheries certified under the MSC system from a seabird perspective. Possible steps for implementing an ecosystem approach to national fisheries within the frame

[1]A dispute exists between the Governments of Argentina and the United Kingdom of Great Britain and Northern Ireland concerning sovereignty over the Falkland Islands (Islas Malvinas), South Georgia and the South Sandwich Islands (Islas Georgias del Sur e Islas Sandwich del Sur) and the surrounding maritime areas.

of Argentina's National Plan of Action—Seabirds and its interaction with current certification schemes are discussed.

SBWG9 Inf 09 reported on the use of carbon and nitrogen stable isotopic values of feathers to evaluate whether the observed expansion in Argentine fisheries operating in the Patagonian Continental Shelf affected Black-browed Albatross diet. The isotopic niche width of contemporary Black-browed Albatross was wider than the one for historic albatrosses suggesting, for the former, a more variable diet. This shift in diet of the Black-browed Albatross in these waters could be a result of responses to the expansion of industrial fisheries and consequential increase of discards as an abundant and predictable food source.

RECOMMENDATIONS TO THE ADVISORY COMMITTEE

SBWG recommends that the Advisory Committee:

1. Encourages ACAP Parties and others to consider and take into account, when producing ecological risk assessments, and other approaches for assessing impacts of fisheries bycatch on seabird populations, the potentially low subsequent survival rate of birds captured alive and released.
2. Recommends ACAP Parties and others that in addition to recording seabird mortality, bycatch observer programmes should always collect data on the circumstances, species, age, and condition of birds captured alive and released.
3. Emphasises the need for more studies of survival of live-caught birds, particularly in longline fisheries.
4. Encourages ACAP Parties and others to consider the importance of cryptic mortality when assessing impacts of fisheries bycatch on ACAP-listed species, and consider the range of possible values based on different studies.
5. Encourages the use of modelling of the distribution of all life stages of albatross and petrel populations in order to better understand the overlap of ACAP species with fisheries.

17. DELIBERATE TAKE AND KILLING OF ACAP SPECIES

17.1 Review of knowledge on deliberate take/killing of ACAP species at sea

SBWG9 Inf 12 summarised historic reports of the deliberate capture of seabirds in the Falkland Islands (Islas Malvinas)[1] squid jigging fleet, and reports on a recent reassessment of this activity in the same fleet. The report also reviewed incidental catch of seabirds in the fishery. Although interactions still appear negligible, monitoring is non-systematic and further work is planned to improve confidence in level of interaction between seabirds and the Falkland Islands (Islas Malvinas)[1] jigging fleet.

SBWG9 Inf 18 reported on sub-lethal effects of fisheries bycatch on seabirds by showing bill mutilations in albatrosses and petrels in the southwestern Atlantic.

SBWG recognised that while the incidental mortality of albatrosses and petrels in hook-based fisheries would ordinarily be considered under other agenda items, **SBWG9 Inf 18** highlighted a distinct concern - the deliberate or reckless harm inflicted on seabirds by bill mutilation. SBWG expressed concern that available information from at-sea investigations and dead seabirds washed up on beaches likely seriously underestimated the extent of mortalities arising from these acts. SBWG highlighted the ongoing value of educating fishing crew about safely handling live-hooked seabirds, as outlined in the de-hooking guidelines. SBWG also highlighted the need to convey to fishing operators that deliberating inflicting harm to live bycaught seabirds was a cruel, unnecessary and illegal practice that undermined conservation efforts concerning the affected species. SBWG noted that the issue of bill mutilation does not reflect intentional take, and so for future meetings could be dealt with under a different agenda item (or modify the title of the agenda item, e.g. Deliberate take, killing and harm of ACAP species).

RECOMMENDATION TO THE ADVISORY COMMITTEE

SBWG recommends that the Advisory Committee:

1. Encourage Parties and others to provide relevant information on the nature and extent of deliberate take of ACAP species at sea, while noting that such take is prohibited under the Agreement.

2. Encourage Parties and others to provide relevant information of accidental captures (bycatch) culminating in practices leading to bill mutilation.

18. FAO IPOA/NPOA-SEABIRDS

18.1 Review and status of implementation of NPOA-Seabirds

SBWG9 Doc 22 reviewed existing National Plans of Action – Seabirds (NPOA-Seabirds) in terms of the approaches used to identify whether there was a seabird bycatch problem, how objectives were set, and what fishery and seabird population thresholds were specified for managing fisheries impacts. The paper sought to identify best practice and make recommendations for future development or review of NPOAs or other relevant documents. SBWG expressed appreciation for the value of this approach to identifying best practice approaches for the development, implementation and enhancement of NPOAs.

SBWG noted reports of upcoming NPOA reviews that will be conducted in Argentina and South Africa. Two information papers (**SBWG9 Inf 13** and **SBWG9 Inf 25)** provided information about updated NPOAs recently adopted in the Falkland Islands (Islas Malvinas)[1] and Australia, respectively.

RECOMMENDATIONS TO THE ADVISORY COMMITTEE

It is recommended that the Advisory Committee:

1. Encourages ACAP Parties that do not have a National Plan of Action – Seabirds (NPOA-Seabirds) to, as relevant, prepare and adopt a plan that fully complies with FAO's Best Practice Technical Guidelines, taking into account the elements of best practice identified in **SBWG9 Doc 22**.

2. Encourages Parties with an existing NPOA-Seabirds to review their plans and strengthen them, as applicable, to ensure full compliance with FAO's Technical Guidelines, taking into account the elements of best practice identified in **SBWG9 Doc 22**.

19. LISTING OF SPECIES ON ANNEX 1

AC11 Inf 04 lists all procellariform species according to IOC World Bird List v9.1 taxonomy, together with the scores assigned to assess their suitability and priority for listing on Annex 1 of the Agreement. This list incorporates the updated scores recommended in **SBWG7 Doc 25** as well as updates to the IUCN and CMS status of species since MoP5 (May 2015).

SBWG recalled that some issues were identified in **SBWG7 Doc 25** that should be addressed in collaboration with the Population and Conservation Status Working Group so that a revised prioritisation list can be presented at AC12. These include the need for clarification of the definition and scoring of at-sea threats, and the overlap between some of the categories.

RECOMMENDATION TO THE ADVISORY COMMITTEE

SBWG recommends that the Advisory Committee:

1. Endorses further work on the prioritisation criteria for ACAP species by SBWG and PaCSWG, so that Table 1 of **AC11 Inf 04** can be revised and presented at AC12.

20. PRIORITY ACTIONS FOR CONSERVATION MEASURES

PaCSWG5 Doc 06 presented a draft reporting template to facilitate efforts to monitor progress against priority actions for the ACAP Priority Populations. The template has been designed to encourage more consistent reporting across these populations. The reporting is not intended to replace a comprehensive action or management plan for the population or species, but to provide a focus for the highest priority actions. SBWG noted that this item was also on the agenda of the PaCSWG meeting, with detailed discussion of the template occurring at that meeting.

21. ACAP FUNDING PROGRAMMES

AC11 Inf 02 provided a summary of the conservation projects and secondments supported by the 2018 funding round agreed by AC10. SBWG welcomed the return of the small grants and secondment programmes, noting that they provide a valuable mechanism to progress ACAP's objectives, through the outputs of the projects themselves and importantly by strengthening collaborations between Parties and building capacity. The Secretariat informed SBWG that the next call for applications is scheduled to take place later in 2019.

22. TOOLS AND GUIDELINES

22.1 Updates and new guidelines

SBWG9 Doc 24 outlined appropriate practices and procedures concerning removing entangled seabirds from nets. The development of these guidelines formed part of AC9's advice. Clear, step-wise advice and illustrations are provided to assist fishers on-board trawl, gillnet and purse seine vessels, including commercial, artisanal and recreational net fisheries. The proposed guide complements a similar guide on hook removal from seabirds.

SBWG welcomed the development of the guidelines and provided some feedback to further improve them, noting that **SBWG9 Doc 26** also included some guidelines for rescue and handling of seabirds entangled/trapped in purse seine fisheries, and encouraged a harmonised approach between these guidelines (e.g. toolbox approach). Several members offered their assistance to progress this task intersessionally, including helping to translate the final product into Spanish. It was also suggested that opportunities to supplement printed instructional material with other media types should also be considered, where appropriate and possible.

SBWG9 Inf 27 summarised progress with updates to the 2015 edition of the Seabird Bycatch Identification Guide, a core task in the AC Work Programme. This task was carried out in collaboration with BirdLife International's Albatross Task Force - Chile, Museum of New Zealand Te Papa Tongarewa, and Forest & Bird, New Zealand, as well as through feedback from several volunteers who provided comments and reference material. It is envisaged that the updated edition of the Guide will be available in English and Spanish by the end of September.

The Executive Secretary advised the meeting that the September deadline would allow the costs associated with finalising this work to be met by external funds potentially provided by FAO for this purpose.

SBWG members offered to provide additional material to help improve the Guide further, and to assist with the update of the Portuguese language Guide.

The Secretariat proposed to coordinate this feedback with Cristián Suazo who carried out the update of the Guide, and to distribute the final version to SBWG members prior to external publication and distribution.

SBWG9 Inf 01, which was also considered under agenda item 7.1., referred to external resources (fact sheets) that have been developed on methods for mitigating seabird bycatch mitigation in pelagic longline fisheries.

22.2 Mitigation Fact Sheets

Revised designs for the new factsheets for hook-shielding devices and line weighting were presented for final approval in **SBWG9 Doc 23**. These are currently only available in English. The document also proposed text for the bird scaring line factsheets for demersal and pelagic longlines -the next factsheets scheduled to be updated and re-designed.

SBWG expressed its appreciation for the work Rory Crawford and Nina da Rocha in developing these new designs to date. SBWG supported the new format, and some observations were made on how the illustrations could be further improved.

The Co-Convenors requested that any detailed inputs should be forwarded to them as soon as possible so that these can be passed on to BirdLife International and the design team.

The Executive Secretary reminded the meeting about the potential availability of funding from FAO if this work could be completed by the end of September. SBWG agreed that work should progress rapidly in order to benefit from this funding, recognising there would be opportunity for further improvements when new editions were developed.

SBWG members offered to assist with translation of the factsheets into Portuguese and Spanish.

SBWG agreed that the bird scaring line factsheets for demersal and pelagic longlines should be re-designed next, as two separate documents, followed by, or in parallel with, the night-setting factsheet, given the status of night-setting as an ACAP Best Practice measure.

RECOMMENDATIONS TO THE ADVISORY COMMITTEE

SBWG recommends that the Advisory Committee:

1. Supports the update of the remaining Mitigation Fact Sheets to the new simplified format in a phased approach prioritising measures that are considered best practice and allocates funding to achieve this aim. This includes the finalisation and production of the new format Mitigation Fact Sheets for line weighting and hook-shielding devices.

2. Endorses further work on the guide to removing entangled seabirds from nets.

23. SBWG WORK PROGRAMME

23.1 Work Programme 2019-2021

Tasks relevant to SBWG in the 2019-2021 Advisory Committee Work Programme approved by MoP6 (**AC11 Doc 11**) were reviewed following discussions at SBWG9. An updated version of **AC11 Doc 11** has been prepared for consideration by the Advisory Committee.

24. ANY OTHER BUSINESS

SBWG was informed about the 4th International Forum on the sub-Antarctic, which is scheduled to take place in Hobart, Tasmania from 29-30 July 2020. The forum will be an opportunity for scientists, land managers, tourism operators, fishers and policy makers to investigate the challenges facing the sub-Antarctic in a changing world and share ideas for the future.

SBWG was informed that election of AC officials will take place at AC11, and that the Co-convenors and Vice-convenors are all eligible and willing to stand for another term.

24.1 3rd World Seabird Conference

SBWG was informed that a symposium titled "Seabird bycatch in commercial fisheries: progress and challenges" has been proposed for the 3rdWorld Seabird Conference, which is scheduled to take place in Hobart, Tasmania, from 19-23 October 2020. The Scientific Programme Committee of the conference is expected to finalise in August 2019 its decision regarding the symposia that have been accepted. SBWG agreed that if the seabird bycatch symposium is accepted, it would represent a good opportunity for broader discussion on a number of actions in the SBWG's work programme. A few members of SBWG have been listed as potential contributors to the symposium in the proposal submitted to the Scientific Programme Committee.

25. ADOPTION OF REPORT

This report has been prepared for the consideration of the Advisory Committee.

26. CLOSING REMARKS

The Co-convenor, Igor Debski, thanked the convenor team for their assistance, the authors of the papers submitted for consideration, and Members and Observers for their valuable contributions to the meeting and in developing the report. The Co-convenor also thanked the hosts, Brazil, and the ACAP Secretariat for providing an excellent venue and facilities for the meeting. The ACAP Science Officer, Wiesława Misiak, the current Executive Secretary, Christine Bogle, and the previous Executive Secretary, Marco Favero, were thanked for their valuable work in support of the SBWG, both intersessionally and during the meeting. Sandra Hale and Cecilia Alal were gratefully acknowledged for their interpretation services during the meeting.

ANNEX 1. LIST OF SBWG9 MEETING PARTICIPANTS

SBWG Members	
Anton Wolfaardt	SBWG Co-convenor, United Kingdom
Igor Debski	SBWG Co-convenor, Department of Conservation, New Zealand
Sebastián Jiménez	SBWG Vice-convenor, Dirección Nacional de Recursos Acuáticos, Uruguay
Juan Pablo Seco Pon	SBWG Vice-convenor, Instituto de Investigaciones Marinas y Costeras, CONICET-UNMDP, Argentina
Luis Adasme	Instituto de Fomento Pesquero, Chile
Joanna Alfaro-Shigueto	Pro-Delphinus, Peru
Barry Baker	Institute of Marine and Antarctic Studies, Australia
Jonathon Barrington	Department of the Environment and Energy, Australian Antarctic Division, Australia
Nigel Brothers	Humane Society International
Johan de Goede	Department of Agriculture, Forestry and Fisheries, South Africa
Marco Favero	Instituto de Investigaciones Marinas y Costeras, CONICET, Argentina
Elisa Goya	Instituto del Mar del Peru (IMARPE), Peru
Jeffrey Mangel	Pro-Delphinus, Peru
Ed Melvin	Washington Sea Grant, USA
Ken Morgan	Canadian Wildlife Service, Environment and Climate Change Canada
Gabriela Navarro	Subsecretaría de Pesca y Acuicultura, Ministerio de Agroindustria, Argentina
Tatiana Neves	Projeto Albatroz, Brazil
Graham Robertson	Australia
Cristián Suazo	BirdLife International
Mark Tasker	JNCC, United Kingdom/ TWG Convenor
Megan Tierney	JNCC, United Kingdom
Advisory Committee Members and Advisors	
Igor Brito Silva	Alternate Representative, Brazil
Mike Double	Alternate Representative, Australia/ TWG Vice-convenor
Caroline Icaza	Member, Ecuador
Verónica López	Advisor, Chile
Patricia Pereira Serafini	Advisor, Brazil/ PaCSWG Vice-convenor
Richard Phillips	Advisor, United Kingdom/ PaCSWG Co-convenor
Gilberto Sales	Advisor, Brazil
Observers	
Ana Bertoldi Carneiro	BirdLife International
Ebone Blyden	The Ministry of the Environment and Housing, The Bahamas

Jéssica Branco	Projeto Albatroz, Brazil
Emanuel Ferreira	Associação R3 Animal
Esteban Frere	BirdLife International
Luiza Garcia	Projeto Albatroz, Brazil
Dimas Gianuka	Projeto Albatroz, Brazil
Jason Jannot	NOAA Fisheries, USA
Nobuhiro Katsumata	National Research Institute of Far Seas Fisheries, Japan
Mi Ae Kim	NOAA Fisheries, USA
Cristiane Kolesnikovas	Associação R3 Animal
Caio Marques	Projeto Albatroz, Brazil
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Alice Pereira	ProjetoAlbatroz, Brazil
Stephanie Prince	BirdLife International
Cynthia Ranieri	Projeto Albatroz, Brazil
Leandro Tamini	BirdLife International
Desmond Tom	Ministry of Fisheries, Namibia
SachikoTsuji	National Research Institute of Far Seas Fisheries, Japan
ACAP Secretariat	
Christine Bogle	Executive Secretary
John Cooper	Information Officer
Wiesława Misiak	Science Officer
Interpreters	
Sandra Hale	OnCallLatam
Cecilia Alal	OnCallLatam

Non-attending SBWG members	
Jorge Azócar	Instituto de Fomento Pesquero, Chile
Paul Brickle	University of Aberdeen, United Kingdom
Andrés Domingo	Dirección Nacional de Recursos Acuáticos, Uruguay
Eric Gilman	Hawaii Pacific University, USA
Svein Løkkeborg	Institute of Marine Research, Norway
Amanda Kuepfer	Exeter University, United Kingdom
Alexandre Marques	Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis, Brazil
Cleo Small	BirdLife International
Roberto Sarralde	Instituto Español de Oceanografía, Spain
Barbara Wienecke	Department of the Environment and Energy, Australian Antarctic Division, Australia
Oliver Yates	Cefas (Centre for the Environment, Fisheries and Aquaculture Science), United Kingdom

ANNEX 2. ACAP SUMMARY ADVICE FOR REDUCING THE IMPACT OF PELAGIC AND DEMERSAL TRAWL FISHERIES ON SEABIRDS

Agreement on the Conservation of Albatrosses and Petrels

ACAP SUMMARY ADVICE FOR REDUCING THE IMPACT OF PELAGIC AND DEMERSAL TRAWL FISHERIES ON SEABIRDS

Reviewed at the Eleventh Meeting of the Advisory Committee
Florianopolis, Brazil 13-17 May 2019

BEST PRACTICE MEASURES

Seabird mortality in trawl fisheries occurs when birds collide with cables as they feed on fish processing waste (offal and discards) or are entangled in trawl nets as they attempt to forage on captured fish or fish parts. Cable strikes, including collisions with net-monitoring cables[1], warp cables[2] and paravanes[3] are associated with the fish waste discharged by vessels that catch and process fish on-board (catcher-processors). It is recognized that larger seabirds (albatrosses and giant petrels) with long wingspans are most vulnerable to cable strike mortalities; however, smaller seabirds can also suffer cable strike mortalities. Although in many fisheries, vessels are required to discard prohibited fish species whole and unprocessed, vessels that catch fish for delivery for shoreside processing (catcher vessels) and do not produce offal are in general not associated with cable strikes. However, seabird net mortalities can occur in catcher-processor and catcher vessels trawl operations

Trawl fisheries are extremely diverse and encompass pelagic trawling for schooling off-bottom species and demersal trawling for fish species on the sea floor. In general, trawl fisheries range from high volume fisheries that land and process hundreds of tons of fish 24 hours a day continuously for weeks, to lower volume fisheries that fish for shorter time periods producing little to no waste. Because fish waste drives cable strikes and can attract birds that may then interact with the net, management of offal discharge[4] is considered the primary means to reduce cable strikes and net entanglements. However, fishery and vessel characteristics dictate the extent to which offal can be managed and the method that might be employed. Where the opportunity for offal management is limited or impractical, cable strikes can be prevented by protecting trawl cables with mitigation devices. Net entanglements can be prevented by reducing the time the net is exposed on the surface of the water. The following

[1]The netsonde monitor cable connects the echo-sounder or net-sounder on the headline of the trawl net to the vessel.

[2]The warp cables or trawl warps are the cables used to tow nets.

[3]A net monitoring transducer deployed along the side and outboard of the vessel

[4]Offal discharge refers to the disposal at sea of any fish waste resulting from processing, including heads, guts and frames. Fish discards refers to any unwanted whole fish (and or benthic material)

measures have been shown to be effective at reducing seabird bycatch in trawl fisheries and are recommended as best practice measures:

Measures to reduce general attractiveness to seabirds

Management of offal and discards

In all cases, the discharge of offal and discards is the most important factor attracting seabirds to the stern of trawl vessels, where they are at risk of cable and net interactions. Managing offal discharge and discards while fishing gear is deployed has been shown to reduce seabird attendance at vessels and consequent risk of interactions and bycatch. The following offal and discard management measures, in order of their effectiveness in reducing bird attendance, are recommended:

1. **Retaining waste** – No discharge during fishing trips (full retention) should occur. When this is impracticable, no discharge should occur during fishing activity (when cables or net are in the water);
2. **Mealing waste** – Where retention of waste is impracticable, converting offal into fish meal, and retaining all waste material with any discharge restricted to liquid discharge / sump water;
3. **Batching waste** – Where meal production and retention of offal and discards are impracticable, waste should be stored temporarily for two hours or longer before strategically discharging it in batches;
4. **Mincing of waste** – Where retention, mealing or batching is impracticable, reduce waste to smaller particles (currently only recommended as a mitigation for bycatch of large *Diomedea* spp.).

Measures to reduce cable strikes

Recognising that even with management of offal and discards there may be residual risk of cable strikes, the following further measures are recommended:

Warp cables

1. Deploy Bird Scaring Lines while fishing to deter birds away from warp cables.

Net monitoring cables

Net monitoring cables should not be used. Where this is impracticable:

1. Deploy Bird Scaring Lines specifically positioned (above the net monitoring cable) to deter birds away from net monitoring cables while fishing; and

2. Install a snatch block at the stern of a vessel to draw the net monitoring cable close to the water and thus reduce its aerial extent.

Measures to reduce net entanglement

Recognising that even with management of offal and discards there may be residual risk of net entanglement, the following further measures are recommended:

1. Clean nets after every haul to remove entangled fish (“stickers”) and benthic material to discourage bird attendance during gear shooting;

2. Minimise the time the net is on the water surface during hauling through proper maintenance of winches and good deck practices; and

3. For pelagic trawl gear, apply net binding to large meshes in the wings (120–800 mm), together with a minimum of 400-kg weight incorporated into the net belly prior to setting.

Further measures include avoiding peak areas and periods of seabird foraging activity. It is important to note that there is no single solution to reduce or avoid incidental mortality of seabirds in trawl fisheries, and that the most effective approach is to use the measures listed above in combination. Net entanglements during the haul remain the most difficult interactions to prevent. The ACAP review of seabird bycatch mitigation measures for pelagic and demersal trawl fisheries is presented in the following section.

ANNEX 3. REVISED ACAP SUMMARY ADVICE FOR REDUCING THE IMPACT OF PELAGIC LONGLINE FISHERIES ON SEABIRDS[1]

Agreement on the Conservation of Albatrosses and Petrels

ACAP SUMMARY ADVICE FOR REDUCING THE IMPACT OF PELAGIC LONGLINE FISHERIES ON SEABIRDS

Reviewed at the Eleventh Meeting of the Advisory Committee
Florianópolis, Brazil, 13 – 17 May 2019

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: branchline weighting, night-setting and Bird Scaring Lines. Alternatively, the use of one of two assessed hook-shielding devices is recommended. 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.

1. Branchline weighting

Branchlines should be weighted to sink the baited hooks rapidly out of the diving range of feeding seabirds. Studies have demonstrated that branchline weighting where there is more mass closer to the hooks, sink most rapidly and consistently; thereby, dramatically reducing seabird attacks on baits and most likely reducing mortalities. Studies of a range of weighting regimes, including placing weights at the hook, have shown no negative effect on target catch rates. Continued refinement of line weighting configurations (mass, number and position of weights and materials) with regard to effectively reducing seabird bycatch and safety concerns through controlled research and application in fisheries, is encouraged.

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. 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)

[1]Note, only the summary advice component of the document is presented here, and not the review section.

weighting regime adequately specified; (b) safety issues adequately addressed; and (c) issues concerning application to artisanal fisheries being taken into account.

Current recommended minimum standards for branchline weighting configurations include the following:

(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.

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.

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*). 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.

Night-setting is recognised as consistently defined, widely reflected in conservation and management measures and has benefit as a primary mitigation measure, as it has the potential for compliance monitoring through VMS and other tools.

3. Bird scaring lines

Properly designed and deployed Bird Scaring Lines (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.

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 bird scaring lines, interruptions in vessel operations and in some cases lost fishing gear. Alternatives, such as 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.

It is recommended to use a weak link to allow the BSL to break-away from the vessel in the

event of a tangle with the main line, and, a secondary attachment between the bird scaring line and the vessel to allow the tangled BSL to be subsequently attached to mainline and recovered during the haul.

Sufficient drag must be created to maximise aerial extent and maintain the line directly behind the vessel during crosswinds. To avoid tangling, this is best achieved using a long in-water section of rope or monofilament.

Given operational differences in pelagic longline fisheries due to vessel size and gear type, bird scaring lines specifications have been divided into recommendations for vessels greater than 35 metres and those less than 35 metres in length.

3. a) Recommendations 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. 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 metres outboard of the side of the vessel that baits are deployed.

3. b) Recommendations 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 at least the first 55 m of the BSL. Streamers may be modified over the first 15 m to avoid tangling, 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 coloured. 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 6 m above the water at the stern.

4. 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 metres), 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 branchline weighting described in Section 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 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. 'Hookpod' – 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*. 2017, 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.

5. Time-Area fishery closures

The temporary closure of important seabird foraging areas (e.g. areas adjacent to important 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.

OTHER RECOMMENDATIONS

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 trialled 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.

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 and discards should not be discharged during line setting. During line hauling, offal and used baits should preferably be retained or discharged on the opposite side of the vessel from that on which the line is hauled. All hooks should be removed and retained on board before discards are discharged from the vessel.

MEASURES UNDER DEVELOPMENT

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.

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.

Laser technology: Although lasers are being used by some vessels, and some research work has been initiated, there is currently no evidence of effectiveness, and serious concerns regarding the potential impacts on the health of individual birds remain.

The ACAP review of seabird bycatch mitigation measures for pelagic longline fisheries is presented in the following section.

ANNEX 4. ACAP ADVICE ON IMPROVING SAFETY WHEN HAULING BRANCHLINES DURING PELAGIC LONGLINE FISHING OPERATIONS

Agreement on the Conservation of Albatrosses and Petrels	**ACAP ADVICE ON IMPROVING SAFETY WHEN HAULING BRANCHLINES DURING PELAGIC LONGLINE FISHING OPERATIONS** *DRAFT*

SUMMARY

The relative safety of weighted branchlines during flyback events in pelagic long line fishing requires thorough consideration. When the branchline is under tension when hauling catch, a flyback event may occur in two ways:

1. a 'bite off' event in which the branchline is bitten off, or
2. a 'tear out' event in which the catch is lost when the hook is torn out of the fish.

At that moment the tensioned branchline may flyback at speed and potentially hit the crew involved in hauling with the weight, and, in the event of a tear out, the hook will also recoil with the weight.

Flyback events are rarely reported. However, there have been a small number of reported cases where these events have caused injury and a few times death.

Weighted branchlines are implemented to reduce the incidence of seabird bycatch. Decreasing the incidental catch of seabirds is important for the conservation of seabirds, especially threatened albatross and petrel species.

Branchline weighting potentially increases the hazard from flyback events.

To avoid or minimise the hazard of a flyback event, various technologies and techniques can be implemented as part of the fishing vessel's hazard management procedure. Branchlines with sliding weights will help to reduce the hazard posed by flyback events, compared with fixed weighted swivels. The crew may employ safety precautions that reduce the potential hazard from a flyback event, and which help to protect those involved in hauling of catch if a flyback event occurs.

A combination of new technologies and better techniques can address the hazard posed by flyback event to crew. These changes will enhance workplace safety when hauling catch during pelagic longline fishing operations.

1. CONTEXT

Pelagic longline fishing is a globalised fishery. Annual fishing effort by coastal states and distant water fishing nations likely exceeds a billion hooks each year (Anderson *et al.* 2011). Incidental mortalities of seabirds during pelagic longline fishing operations is a widely recognised conservation threat to seabird species, particularly threatened albatrosses and petrels listed under the *Agreement on the Conservation of Albatrosses and Petrels* (ACAP)[1] (Brothers 1991, Gales *et al.* 1998). Global seabird bycatch in longline fisheries (pelagic longline and demersal longline) is estimated to be at least 160,000 (and potentially in excess of 360,000) seabirds every year (Anderson *et al.* 2011).

ACAP aims to achieve and maintain a favourable conservation status for albatrosses and petrels. ACAP has developed advice and guidance to mitigate threats to albatrosses and petrels on land and at sea, including best practice advice for reducing the impact of pelagic longline fisheries on seabirds (ACAP 2017).

Branchline weighting is an effective strategy for reducing seabird bycatch. Three best practice measures are recommended by ACAP to be used simultaneously: branchline weighting, night-setting and bird scaring lines (ACAP 2017). Branchline 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 (ACAP 2017). Branchline weighting increases the sink rate of a baited hook, reducing the time when the baited hook is within the diving range of seabirds (Barrington *et al.* 2016). Studies have demonstrated that branchline weighting, where there is more mass closer to the hooks, sink most rapidly and consistently (Barrington *et al.* 2016), significantly reducing seabird bycatch (Gianuca *et al.* 2013, Jiménez *et al.* 2013, Claudino dos Santos *et al.* 2016, Jiménez *et al*. 2017). ACAP recommends the use of three weighted branchline configurations (ACAP 2017):

1. 40 g or greater attached within 0.5 m of the hook, or
2. 60 g or greater attached within 1 m of the hook, or
3. 80 g or greater attached within 2 m of the hook.

Hook-shielding devices are effective technologies for reducing seabird bycatch. There is less seabird bycatch when the baited hooks are protected from seabird attacks by a hook-shielding device (Sullivan *et al.* 2017, Baker *et al.* 2016, Barrington 2016). ACAP recommends the use of hook-shielding devices that 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 m), or until after a minimum period of immersion has occurred (a minimum of 10 min) that ensures that the baited hooks are released beyond the foraging depth of most seabirds (ACAP 2017). ACAP presently recommends using two hook-shielding devices that meet ACAP's stipulated performance requirements, the 'Hookpod' (68 g minimum weight) and 'Smart Tuna Hook (40 g minimum weight) (ACAP 2017). The former remains attached to the branchline, while the latter detaches at depth during setting.

[1] *Agreement on the Conservation of Albatrosses and Petrels*, done on 19 June 2001, 2258 UNTS 257 (entered into force 1 February 2004).

Pelagic longline fishing vessels are a workplace. Crew face a range of workplace hazards during fishing operations. One of these hazards is a flyback event (Sullivan *et al.* 2012). Research has been undertaken to characterise the hazard posed to crew during a flyback event. ACAP has contributed to the funding of this research. The research has examined what happens when the branchline is under significant tension and that tension is released in circumstances that simulate a flyback event (see 3.2 below). Further research has considered both bite off and tear out events, and whether the flyback event is affected by factors including: (a) release of tension under water v the water surface, (b) where the hook is bitten off ('bite off' events) v where the is torn out of the fish ('tear out' events), (c) fixed weight v sliding weight branchline weighting, (d) branchline weighting configurations and (e) use of 'Hookpods' (see 3.3 below). Understanding how a flyback event may occur helps crew to recognise circumstances when the hazard of flyback event is greater when hauling during pelagic longline fishing operations.

The hazard to crew from flyback events is widely recognised. Although flyback events are rarely reported, there have been reports in fisheries where weighted branchlines are used of some injuries and even death (McCormack and Papworth 2014). The potential speed at which a flyback event occurs ordinarily means that the crew will not be able to take any evasive action. The potential consequences of a flyback event highlight the need to implement workplace hazard management procedures on fishing vessels undertaking pelagic longline fishing operations (Marine Safety Solutions 2008).

Research has considered ways to characterise the hazard posed by flyback events during pelagic longline fishing operations. This research highlights the importance to mitigate the hazard of flyback events and the benefits to crew safety if this workplace hazard is addressed (see 3.3 below). This research has considered: (a) ways to reduce the tension on the branchline when hauling catch, (b) benefits of sliding weights v fixed weights, (c) branchline weighting configurations that reduce the potential hazard from bite offs and tear outs while using sliding weights, (d) value of employing angled hauling strategies and (e) value of personal protective equipment. Understanding ways to avoid or mitigate flyback events helps crews to develop workplace hazard management procedures that improve crew safety when hauling during pelagic longline fishing operations. This in turn helps to respond to safety concerns within affected fisheries about using branchline weighting.

2. INTRODUCTION

Fly back events arise when catch is being retrieved during hauling and the branchline is under tension. Fly back events occur under two circumstances:

1. **'bite off'** — a bite off event may occur when the hook is bitten off, often by a shark, which potentially sends the tensioned branchline recoiling back towards the vessel.
2. **'tear out'** — a tear out event may occur when the catch is lost off the hook, which potentially sends the tensioned branchline and hook recoiling back towards the vessel.

Flyback events are rarely reported. There is no substantive information available about the likelihood of a flyback event occurring in the globalised pelagic longline fishery. There is limited information about the potential hazard posed by flyback events to crew.

The potential hazard from flyback events is significantly reduced in some circumstances. If the tension on the branchline is released while the weight attached to the line is underwater, drag underwater quickly dissipates the energy released. As well, the amount of tension on the line when a bite off or tear out occurs may be insufficient for the branchline to recoil with sufficient energy to be hazardous. Recoiling branchlines and weights in flyback events may in these instances strike the vessel hull or fall short into the water depending on the amount of tension on the line and how submerged the weight is.In some pelagic longline fisheries a flyback event may occur when a hooked shark is alongside the vessel and the line is purposely cut to release it (Rollinson 2017).

Flyback events have the potential to cause injury to crew involved in hauling catch. Flyback events are likely under-reported. Flyback events that do not result in injury to crew are predominantly not reported (Pierre *et al.*2015, Rollinson 2017).

3. STUDIES

3.1 Survey

A survey study has been undertaken concerning flyback events. This study considered pelagic longline fishing over a 20-year period between 1994 and 2014 (McCormack and Papworth 2014). The survey involved six countries; Australia, Chile, New Zealand, South Africa, the United Kingdom and the United States. Over the survey period there were 12 reported injuries and three deaths from flyback events from weighted branchlines during pelagic longline fishing operations involving over a billion hooks (McCormack and Papworth 2014, Anderson *et al.* 2011). The reported events noted that the crew member was struck in the head in a majority of instances (McCormack and Papworth 2014).

The survey was limited by only considering reports about flyback events (McCormack and Papworth 2014). The survey did not provide information about the frequency or amount of flyback events that occurred, or where the hazard posed flyback event was not considered significant. These data are not routinely collected or reported during fishing operations. Following a death in a New Zealand pelagic longline fishery in 1996, New Zealand moved to no longer use weighted branchlines in its pelagic longline fisheries (Marine Safety Solutions 2008).

3.2. Research

3.2.1 Early Research

Early safety research sought to characterise the hazard posed by flyback events in pelagic longline fisheries. Consideration was given to whether early sliding weight designs were safer than fixed weights in flyback events (Marine Safety Solutions 2008). The research tested branchlines at varying levels of tension to determine the velocity of attached fixed weights and sliding weights and whether the weights would recoil with force. Sliding weights were found to have a significant reduction in velocity, compared to fixed weighted swivels, due to their ability to slide off the branchline when it recoiled, with the detached weight falling into the water in most cases (Marine Safety Solutions 2008). A later study found that the level of tension and the position of the weight on the branchline was a significant factor affecting whether the sliding weight would slide off the line in a flyback event. Branchlines under tension above 20 kg that had weights placed no more than 2 m from the hook were found to slide off the line.

Weights placed at distances greater than 2 m from the hook were not as effective at sliding off the line, even under higher levels of tension on the line (Sullivan *et al.* 2012).

3.2.2 Recent Research

At-sea studies have been undertaken concerning flyback events. Bite off events were found to occur on a more frequent basis compared to tear out events due to catching sharks (Robertson *et al.* 2013, Rollinson 2017). Tear out events occurred due to the accidental loss of the catch, which in some cases was controlled by the crew member responsible for the hauling operation (Robertson *et al.* 2013). An at-sea study reported that of a total of 17 flyback events 14 were bite offs while three were tear outs (Rollinson 2017). Another study found that in one bite off event, the shark bit off the line at the hook between the hook and the crimp, causing the line to recoil in a manner like a tear out event, i.e. the attached sliding weight was unable to slide off the branchline (Pierre *et al.* 2015).

Research found that placing a sliding weight on the branchline close to or at the hook was effective in having the sliding weight slide off in a bite off event (Robertson *et al.* 2013).

Research found that in a tear out event, placing the sliding weight at or close to the hook meant that the sliding weight did not slide off the branchline, as the collision energy arising from the recoiling hook was insufficient for the hook to be sheared off when it hit the sliding weight (Robertson *et al.* 2013, Rawlinson *et al.* 2018).

Research suggests that a balance is needed in tear out events between the mass of the sliding weight and its position from the hook, so that the recoiling hook would be shorn off the branchline when it hit the sliding weight as the collision energy arising from the recoiling hook is sufficient for the hook to be sheared off when it hit the sliding weight (Robertson *et al.* 2013, Rawlinson *et al.* 2018).

3.2.3 Potential hazard during flyback events

Previous research focused on velocity and the conditions of severe flyback events. McCormack (2015) conducted research that characterised the hazard posed by flyback events to crew. The research determined the velocity of the recoiling weights attached to the branchline and then calculated the kinetic energy involved during a flyback event. The kinetic energy varied significantly depending upon where the weight was positioned on the branchline and whether the weight was submerged or out of the water when the flyback occurred. If the weight was submerged the kinetic energy quickly dissipated. The weight recoiled with the greatest kinetic energy when it was at or above the surface of the water, free from any drag from the water (McCormack 2015).

McCormack (2015) also considered approaches to determine whether potential significance of the hazard posed by a flyback event. She adopted the Blunt Trauma Criterion (BTC) as a measure of relative safety. This criterion takes into account the velocity, mass, size and kinetic energy of the weight (Sturdivan *et al.* 2004, Frank *et al.* 2011). It applies these measurements to determine the effect of the weight at the point of impact on the person struck, i.e. the significance of the hazard. By applying the BTC, McCormack (2015) reported that a smaller weight resulted in a lower BTC score, however the effect of weight size was negligible if the flyback event occurred at a high velocity.

This research supports establishing a hazard management procedure to improve safety when hauling branchlines during pelagic longline fishing operations (see 5 below).

3.3 ACAP Research

ACAP commissioned the Australian Maritime College to undertake independent research on improving safety when hauling branchlines during pelagic longline fishing operations that built on the earlier studies. This research applied the approach developed by McCormack (2015) to examine the kinetic energy involved, and the relative safety of a flyback event.

3.3.1 Bite off events

Bite off events were the focus of research by McCormack and Rawlinson (2016). This research examined the relative safety of ACAP's recommended branchline weighting configurations during flyback events. The research determined the velocity, kinetic energy and BTC scores for different fixed and sliding weight configurations in simulated bite off events. Only two of ACAP's three recommended branchline weighting configurations were able to be tested (for 40 g and 60 g fixed and sliding weights), as 80 g sliding weights were not commercially available at the time of experimentation.

A baseline was determined where the BTC score indicated that serious injury would occur at least 50% of the time from a flyback event involving a fixed-weight branchline. Sliding weights placed within 1 m of the hook significantly reduced the relative hazard, as they consistently slid off the line in a bite off event. Sliding weights were found to have a mean slippage of three metres when the line was under high tension (80 kg). All fixed weight branchline configurations were considered a greater relative hazard in a flyback event.

The research demonstrated that for bite off events the use of sliding weights with branchline configurations of 40g or greater attached within 0.5 m of the hook, and 60g or greater attached within 1m of the hook significantly reduced the relative hazard. Further research will be required to assess the relative safety of a sliding weight of 80g or greater attached within 2 m of the hook.

It is important to recognise that the findings of McCormack and Rawlinson (2016) consider flyback events where the branchline is under high tension (80 kg). The relative hazard posed to crew in pelagic longline fishing operations is likely to rarely reach that considered in the safety research.

The research supports establishing a hazard management procedure to improve safety when hauling branchlines during pelagic longline fishing operations (see 5 below). This is particularly important where fixed weight branchline configurations are employed.

3.3.2 Tear out events

Tear out events were an additional focus of research undertaken by Rawlinson *et al.*(2018). This research examined the relative safety of ACAP's recommended branchline weighting configurations during flyback events. The research determined the velocity, kinetic energy and BTC scores for different fixed and sliding weight configurations in simulated bite off and tear out events. Hookpods (50 g) were also tested to determine their effectiveness in shearing the hook off in a tear out event.

Fixed weighted swivels were considered a greater relative hazard in a flyback event (Rawlinson *et al.* 2018). The BTC scores were above the level where serious injury would occur at least 50% of the time from a flyback event. The research showed that the point of

impact of the weight and hook were closely aligned and struck very near the path along which the branchline was being hauled.

Sliding weights significantly reduced the relative hazard in some settings (Rawlinson *et al.* 2018). Research found that in the event of a tear off event, if heavier sliding weights (60g) were positioned within 1 m of the line, the sliding weight slid off the branchline, as the collision energy arising from the recoiling hook was sufficient for the hook to be sheared off when it hit the sliding weight. This branchline weighting configuration 60 g or greater within 1 m of the hook significantly reduced the relative hazard in a tear out event. Research found that lighter sliding weights (40g) positioned at 0.5 metres closer to the hook were less effective in their ability to shear the hook off.

The research found the Hookpod (50 g) was ineffective in a tear out in shearing off the hook from the line in a majority of flyback events (Rawlinson *et al.* 2018). The Hookpod is largely made of plastic components and the recoiling hook predominately shattered the Hookpod significantly reducing the relative hazard. However, the results varied; in circumstances where the Hookpod remained partially attached to the branchline, the relative hazard was greater. The relative hazard was also greater for detached pieces of the Hookpod where the fragments recoiled back with the branchline (Rawlinson *et al.* 2018).

The research demonstrates that for tear out events the use of sliding weights with a branchline configuration of 60g or greater attached within 1m of the hook significantly reduced the relative hazard. Further research will be required to assess the relative safety of a sliding weight of 80g or greater attached within 2 m of the hook.

It is important to recognise that the findings of Rawlinson *et al.* (2018) considered flyback events under experimental conditions where the branchline is under high tension (80 kg). The relative hazard posed to crew in pelagic longline fishing operations is likely to rarely reach that considered in the safety studies.

The research supports establishing a hazard management procedure to improve safety when hauling branchlines during pelagic longline fishing operations (see 5 below). This is particularly important where fixed weight branchline configurations are employed.

4. IDENTIFYING THE HAZARD

In any industrial setting there are workplace hazards. There is a range of workplace hazards on fishing vessels. Flyback events are a potential hazard that may occur when hauling catch during pelagic longline fishing operations.

The hazard posed by a flyback event has certain characteristics.

A flyback event hazard only arises when the branchline is under tension when hauling catch. The potential hazard increases as the tension on the line increases, by the actions of the crew placing the line under tension by hauling the catch, and/or by the actions of the hooked fish by swimming against the direction at which the line is being hauled. Although the crew can manage the former situation, vigilance is required to manage tension on the branchline in the latter situation.

A flyback event only arises when the tension on the branchline is released when hauling catch. This may occur under two circumstances: (1) a bite off event, and (2) a tear out event (see 2 above).

In some circumstances, a bite off may occur between the hook and the crimp that attaches the hook to the branchline. In these circumstances, the hazard posed by a recoiling branchline is potentially closer to that arising in a tear out event, e.g. if the crimp prevents a sliding weight from sliding off the branchline.

A flyback is only hazardous to crew in instances where the tension that is released is sufficient for the branchline to recoil directly towards the area where hauling is occurring.

The potential hazard posed by the recoiling line is dissipated if the bite off or tear out occurs while the weight on the branchline is submerged under water—as the drag imposed on the weight by the water rapidly dissipates the energy released. The potential hazard is higher if the weight on the branchline is at or above the waterline.

Flyback events may occur at high velocities. In these instances, there will be insufficient time for the crew involved in hauling catch during pelagic longline fishing operations to take action to avoid being hit by any recoiling projectile.

The hazard posed by a flyback event potentially affects the crew involved in hauling catch on the port or starboard sides of the vessel, either at the open door or behind the adjacent bulwark. The crew may potentially be struck by the recoiling line, the weight on the line, the hook, and fragments, e.g. from a recoiling Hookpod. The potential hazard to crew is reduced when personal protective equipment, particularly hard hats and face shields are worn. The potential hazard to crew is significantly reduced if the line is hauled at an angle, away from the open door.

Sliding lead weights have the ability to slide off the line in a flyback event. This may significantly reduce any hazard in a bite off event, and may significantly reduce any hazard in a tear out event, depending on the branchline weighting configuration.

Fixed weights are potentially hazardous in both bite off and tear out events. The weight will remain attached to the recoiling branchline in a flyback event.

5. ADDRESSING THE HAZARD

5.1 Hazard management procedure

The hazard posed by a flyback event may be addressed by implementing an appropriate workplace hazard management procedure. The hazard management procedure should focus on the potential for flyback events to occur when crew are hauling catch during pelagic longline fishing operations. The procedure should outline the technologies and techniques for avoiding or minimising the hazard posed by a flyback event to crew.

Technologies and techniques for avoiding or minimising a flyback event should be used in combination.

5.2 Core procedures

Where possible tension on the branchline should be kept to a minimum when hauling catch. Letting the fish run will help to minimise tension on the branchline.

Personal protective equipment should be used by crew involved in the hauling of catch. Wearing this safety equipment will help to reduce the potential hazard from a flyback event. Core protective equipment includes hard hats and helmets that help protect the head, as well as shields and visors that help protect the face. Additional protective equipment should also be considered to protect the upper chest.

Angled hauling methods help to remove the crew involved in hauling catch from the direct path of a recoiling branchline. Poles or loops can be welded onto the vessel's bulwark that allow for hauling to proceed away from the open door and the direct path of a flyback event. The bulwark provides additional protection to crew when angled hauling methods are employed.

5.3 Fixed weights

Where fixed weights are used, the core workplace hazard management procedures should be employed.

Branchline weighting configurations with fixed weights are considered a greater relative hazard in the event of a flyback as the weight is attached to the branchline when it recoils. The hazard to crew is similar in both bite off and tear out flyback events.

5.4 Sliding weights

Sliding weights should be preferred over fixed weights. Sliding weights are designed to slide off a recoiling branchline.

If a sliding weight is used according to ACAP's best practice advice for branchline weighting the relative hazard of a bite off event may be significantly reduced. For bite off events the use of sliding weights with branchline configurations of 40g or greater attached within 0.5 m of the hook, and 60g or greater attached within 1m of the hook significantly reduced the relative hazard (McCormack and Rawlinson 2016).

If a sliding weight is used according to ACAP's best practice advice for branchline weighting the relative hazard of a tear out event may be significantly reduced. For tear out events the use of sliding weights with a branchline weighting configuration of 60 g or greater within 1 m of the hook significantly reduced the relative hazard (Rawlinson *et al.* 2018). Research has found that lighter sliding weights of 40 g or greater attached within 0.5 metres of the hook were less effective (Rawlinson *et al.* 2018).

5.5 Hook-shielding devices

Research demonstrates that for bite off events the Hookpod (50 g) has similar characteristics of a sliding weight 40g or greater attached within 0.5 m of the hook. The Hookpod will slide off the branchline in a flyback event and significantly reduced the relative hazard (Rawlinson *et al.* 2018).

Research has found that for tear out events a Hookpod (50 g) attached at any distance from the hook was less effective (Rawlinson *et al.* 2018). The Hookpod was also found to break into fragments during the tear out event and the relative hazard was greater (Rawlinson *et al.* 2018).

The ‘Smart Tuna Hook’ was not the subject of research into flyback events. This hook-shielding device is distinct, in that when setting occurs the shield detaches from the hook 10 min after immersion in seawater (Baker *et al.* 2016, ACAP 2017). This means that the branchline is unweighted when it is hauled. In bite off events using a Smart Tuna Hook significantly reduces the relative hazard, as the recoiling branchline lacks any weight. In tear out events the relative hazard from the recoiling hook is greater.

6. CONCLUSIONS

6.1 General conclusions

Branchline weighting is an important best practice technique for reducing seabird bycatch in pelagic longline fisheries. ACAP best practices recommend weighting configurations that help to minimise seabird bycatch, particularly bycatch of threatened albatross and petrel species. Hook-shielding devices also contribute to reducing seabird bycatch.

Pelagic longline fishing is an industrial activity with consequent workplace hazards to crew involved in hauling catch. Flyback events are a workplace hazard that arises when crew are hauling catch on branchlines in circumstances where the line is under tension and that tension is released in a bite off or tear out event. Completely eliminating the hazard from flyback events is difficult. Research has characterised the hazards to crew from flyback events when hauling catch.

Hazard management procedures are essential to crew safety during pelagic longline fishing operations. Research has identified ways to help reduce the relative hazard from flyback events.

For fixed weights, the weight, size and position on the line of the branchline weighting configuration are contributing factors affecting the potential hazard posed by a flyback event. Smaller sized weights resulted in a lower relative hazard, however the difference in weight is negligible when a flyback event occurs at a higher velocity. The highest relative hazard concerning a flyback event was when the weight was at or above the water line. The energy arising from a flyback event was quickly dissipated if the weight was submerged when the tension on the line was released, due to the drag imposed by the water.

To reduce the hazard from flyback events when a bite off event occurs, sliding weights of40g or greater attached within 0.5 m of the hook, and 60g or greater attached within 1m of the hook significantly reduced the relative hazard. Sliding weights were found to have a mean slippage of 3 m when the branchline is at a higher level of tension. This highlights that a branchline weighting configuration where a sliding weight is placed close to the hook will help to reduce the hazard from a flyback event.

Tear out events are a greater relative hazard. This is because the hook potentially recoils with the weight on the branchline. In flyback events when a tear out event occurs, sliding weights of60g or greater attached within 1m of the hook significantly reduced the relative hazard. Lighter sliding weights of 40g or greater attached within 0.5 metres of the hook and the Hookpod (50 g) were less effective, and the Hookpod was also found to break into fragments during the tear out event.

6.2. Future Studies

Research conducted to date has provided important insights concerning the hazards associated with branchline weighting in pelagic longline fisheries. This research has identified a range of technologies and techniques that help to respond to this workplace hazard.

Additional research is recommended. ACAP's recommended branchline weighting configuration of 80 g or greater attached within 2 m of the hook should be assessed, if an 80 g sliding weight becomes commercially available. No stretch branchlines should be considered. A no stretch branchline would not recoil in a flyback event. Underwater setting devices should be considered. These technologies may reduce or eliminate the need for branchline weighting, as setting occurs by stealth at a depth beyond the depth ordinarily reached by diving seabirds (Robertson *et al.* 2015, Robertson *et al.* 2018).

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ANNEX 5. SEABIRD BYCATCH MITIGATION TOOLBOX FOR PURSE SEINE FISHERIES

Status in relation to mitigation efficacy (applies to the tables in Annex 5 and 6):

	Reduced bycatch of ACAP species
	Reduced seabird bycatch, not proven for ACAP species
	No reduction in seabird bycatch, but reduced other bycatch fauna
	Testing in progress or tested in non SSF fisheries
	No reduction in bycatch

Mitigation	**Function**	**Testing**	**Findings**	**Additional benefits**	**Limitations/considerations**	**Source**	**Status**
Water spraying	Physical barrier for seabirds (Mexico)	Need systematic evaluation	Preliminary trials may affect seabird presence in risk areas into the net (*e.g.* pelicans)	N/A	1. Needs to be handled by one person in a reduced crew (*e.g.* small-scale purse seine) 2. Absence of appropriate facilities and training would be harmful for seabirds (water cannon instead of water spraying) 3. The use of waters pumped from the same waste waters may contain edible oils can potentially affect seabird plumage	Suazo *et al.* (in prep.)	
Edible oil release	Sensorial / physical deterrent to keep away seabirds (Australia)	Need systematic evaluation	Trials demonstrated no effects of shark oil *vs* controls on seabird feeding activity of shearwaters	N/A	1. Oil should attract other seabird or non-target taxa to fishing operations 2. Available re-supplies on board are needed	Puglisi (2007)	

Mitigation	Function	Testing	Findings	Additional benefits	Limitations/considerations	Source	Status
					3. The use of oil may have other detrimental effects (*e.g.* plumage)		
Sound	Sensorial deterrent to keep away seabirds (Chile)	Need systematic evaluation	Trials demonstrated effects of noise deterrents on the abundance of some sensitive seabird species (*e.g.* gulls) in contrast to Procellariiform species	N/A	1. Recommended additional sound devices to influence in other seabird species than gulls with unexpected harmful effects on seabirds and crews 2. Consideration of noise pollution when communal fishing exists (*e.g.* small scale purse seine)	Diez (2017)	
Laser	Sensorial deterrent to keep away seabirds (Chile)	Need systematic evaluation	Preliminary trials showed operational limitations during daylight and for certain seabird species like gulls	N/A	1. Potential detrimental effects on seabirds and crews must be taken into account and evaluated 2. Not recommended without an appropriate experimental design and safety protocols	Diez (2017)	
Scaring kite	Physical barrier to reduce the presence of seabirds in risk areas (Portugal)	Systematic ally trialled	Trials showed effect of this scaring device on activity of seabirds but with no bycatch events recorded for treatment and control sets	N/A	1. Need operation by a crew member 2. Need to be trialled in areas of high occurrence of ACAP listed species like Balearic Shearwaters	Oliveira (*in litteris*)	

Mitigation	Function	Testing	Findings	Additional benefits	Limitations/considerations	Source	Status
Modified purse seine	Technical modifications on fishing gear (Chile)	Systematically trialled	Trials showed the reduction in seabird bycatch for diving seabird species by 98% related to the reduction of entanglement in fishing gear	1. Modified purse seine showed improvement in catch success of the target fish species 2. Reduction in netting material with savings in future maintenance or new fishing gear		Suazo *et al.* (2016; 2017a,b)	

ANNEX 6. SEABIRD BYCATCH MITIGATION TOOLBOX FOR ARTISANAL AND SMALL-SCALE FISHERIES

Demersal setnet

Mitigation	Function	Testing	Findings	Effect on target catch	Human safety considerations	Additional benefits	Limitations / considerations	Source	Status
Net illumination	Increase net visibility	Small-scale demersal gillnet fishery Guitarfish and flounder Sechura Bay, Peru	Addition of green LEDs reduced guanay cormorant bycatch rate 85%	No reduction in target catch rates in illuminated nets		Reduced sea turtle bycatch by 64%	LED spacing at 10m Management of spent batteries	Ortiz et al. 2016 Mangel et al. 2018	✓SSF tested
		Additional trials added here…							
Orange net colour	Increase net visibility	On Little Penguins (*Eudyptula minor*) in captivity	Orange color monofilament lines resulted in 5.5% lower collision rates. clear and green monofilament lines resulted in higher rates of collision (35.9% and 30.8%, respectively)					Hanamseth et al.2017.	

Mitigation	Function	Testing	Findings	Effect on target catch	Human safety considerations	Additional benefits	Limitations / considerations	Source	Status
Buoyless nets	Undetermined but may reduce net vertical profile	Small-scale setnet fishery Groupers, halibut, guitarfish Baja California Sur, Mexico	Reduced sea turtle bycatch rate by 68%	Maintained target catch rate and composition			No evidence of seabird bycatch monitoring or reduction	Peckham et al. 2015	✓SSF tested
Metal oxide / barium sulfate nets	Possibly increases net stiffness (and increased acoustic reflectivity)	Demersal gillnet fishery Haddock, cod, pollock, spiny dogfish Lower Bay of Fundy, New Brunswick, Canada	Reduced bycatch of Greater Shearwaters (*Puffinus gravis*)			Reduced harbor porpoise bycatch Maintained target species catches		Trippel et al. 2003	
Reduced vertical profile net	Less net surface area	Commercial large mesh gillnet fishery Southern flounder Pamlico Sound, NC, USA	Reduced sea turtle bycatch			Maintained acceptable levels of target catches	No evidence of seabird bycatch monitoring or reduction	Price and Van Salisbury 2007	

Driftnet / entangling net

Mitigation	Function	Testing	Findings	Target catch	Human safety considerations	Additional benefits	Limitations / considerations	Source	Status
Highly visible netting in upper net and acoustic alarms	Increase net visibility, acoustic reflectivity	Coastal drift gillnet Salmon Puget Sound, Washington, USA	Common murre bycatch reduced by 40-45%, depending on treatment. Rhinoceros auklet bycatch reduced by 42% in deep visual alert treatment. Acoustic alarms reduced murre bycatch by 50%.					Melvin et al. 1999	
High-visibility panels	Increase net visibility	Ongoing						Birdlife International	

Demersal longline

Mitigation	Function	Testing	Findings	Target catch	Human safety considerations	Additional benefits	Limitations / considerations	Source	Status
NISURI fastset	Reduce bait availability for birds	Small-scale demersal longline Hake Santa Rosa, Ecuador	Increased set speed ~10x					Brothers et al. 2014	✓SSF Tested

ANNEX 7. WORKSHOP ON ACAP'S RFMO ENGAGEMENT STRATEGY - AGENDA

Plan and Agenda

Cleo Small, Igor Debski, Nathan Walker, Anton Wolfaardt, Stephanie Prince

1. Objective/rationale

Workshop objective: Identify the most effective and efficient ways to engage with tuna Regional Fisheries Management Organisations (RFMOs) to deliver on ACAP conservation objectives (2019-2022).

Workshop rationale: ACAP and ACAP Parties, along with other stakeholders such as BirdLife International and Humane Society International, have been active in engaging with tuna RFMOs (and other RFMOs) for circa fifteen years, in order to reduce bycatch of ACAP species.

In the early period (2005-2012), engagement focused on promoting adoption by tuna RFMOs of seabird conservation and management measures plus subsequent refinement (13 seabird CMM iterations adopted during this period). 2012 was the milestone when all five tuna commissions had adopted measures to require their pelagic longline vessels to use some combination of bycatch mitigation measures in (most) areas overlapping with albatross distribution.

In 2012-2018, ACAP and other stakeholders broadened engagement with tuna RFMOs to seek improvement in bycatch data collection and reporting requirements and to promote plans to review the impact of the seabird CMMs, as well as working to support pelagic longline fleets to implement the seabird CMMs. There were also further refinements to seabird CMMs, with four seabird CMMs adopted in this period, three of which were in WCPFC.

However, data presented to tuna RFMOs indicates that bycatch rates of ACAP species remain high, while tuna RFMOs have identified that bycatch data collection and reporting remains inadequate for monitoring bycatch levels. In February 2019, a global seabird bycatch estimation workshop was conducted as part of the Common Oceans Tuna Project, generating an estimate of current seabird bycatch levels in the global pelagic longline fleets in the Southern Hemisphere. In light of this, 2019 is an important moment to assess how best to engage and support global pelagic longline fleets in order to reduce bycatch of ACAP species.

The core elements that the workshop will cover are:

(i) Share views on strengths and weaknesses of using tuna RFMOs as a means to enhance bycatch reduction of ACAP species

(ii) Based on (i), identify the aspects of seabird bycatch mitigation that are best addressed via tuna RFMO structures versus via engagement at country or fleet level**.**

(iii) For those aspects identified in (ii), identify the most effective approaches to successful engagement with tuna RFMOs, including what types of meetings to engage with, what inputs will be most effective, who may be best placed to undertake which role.

(iv) Prioritise which tuna RFMOs to engage with.

(v) Provide feedback on the draft ACAP RFMO Strategy (SBWG9 Doc 07), to be presented at the SBWG9 meeting.

2. Planning and logistics

Workshop host: ACAP

Workshop date, duration, location: Sunday 5th May, ACAP SBWG meeting venue, intend 9am to 3.00pm (two-thirds of a day)

Organising committee: ACAP: Anton Wolfaardt, Igor Debski, Nathan Walker. BirdLife: Cleo Small, Stephanie Prince.

Participant list: open invitation to SBWG attendees. Registration will be as part of delegate registration process for AC11 and WGs.

3. Agenda

0900 - 1030 Morning session 1

- Welcome to meeting *(Session lead/facilitator to be confirmed)* and round-table intros (20 mins)
- Morning session 1: Progress and challenges of engaging with RFMOs to reduce albatross bycatch in global pelagic longline fisheries.

Four panellists (one ACAP Secretariat, two member states, one NGO) present 5 minutes each on their views on progress/challenges/strengths/weaknesses, followed by facilitated group discussion. Total 25 mins for presentations plus 45 mins facilitated discussion

Output: SWOT analysis of engaging with RFMOs (as opposed to engaging directly with fleets or member states).

1030-1100 Morning tea

1100 - 1300 Morning sessions 2 & 3

- Morning session 2 (1100-1200): What elements are best progressed via RFMOs compared to being coordinated via ACAP or through ACAP/ACAP Parties/other stakeholder engagement with other national fleets? *(Session lead/facilitator to be confirmed)*

Discussion session covering key activities that are identified in IPOA-Seabirds, i.e.:

- Regulations regarding use of mitigation measures and seabird bycatch reduction objectives

- Enhancing uptake by fleets (Education outreach vessels, strengthening compliance monitoring)
- Enhancing bycatch data collection and reporting
- Periodic performance review

The discussion will be run in a carousel format (participants circulate in groups to each of four flip-charts where they make comments on benefits of pursuing progress in that activity via RFMOs as opposed to engaging with national fleets. Each flipchart to have a facilitator, ready with some explanation/context. Report back on key points.

Output: priorities identified for engaging with tuna RFMOs i.e. monitoring vs data standards vs compliance monitoring vs education/outreach, also with priorities identified within each category.

- Morning session 3 (1200-1230): Prioritise which tuna RFMOs to engage with *(Session lead/facilitator to be confirmed)*.

Based on bycatch assessments and knowledge of opportunities or synergies, prioritise RFMOs for engagement in 2019-2022.

Output: summary of priority RFMOs identified, by year where relevant (e.g. to maximise any known opportunities or synergies).

LUNCH 1230 -1300

- Afternoon session 1 (1300 - 1400): What are the most effective approaches to engaging with tuna RFMOs *(Session lead/facilitator to be confirmed)*

Discussion session using priorities from previous session to identify what types of meetings and what types of inputs will be most effective, who is best placed to undertake what (e.g. ACAP Members, ACAP Secretariat, NGOs).

Output: summary of approaches identified.

- Afternoon session (1400-1500): Feedback on ACAP RFMO Strategy *(Session lead/facilitator to be confirmed)*

Use the output from all sessions as basis for developing key elements of feedback on ACAP Strategy. This will be documented as a tracked change copy of the ACAP Strategy for presentation to the SBWG9 meeting.

Output: feedback on ACAP strategy.

4. Documents

Documents for the workshop will be made available on the ACAP website. We encourage all participants to read these documents in advance of the meeting.

5. Expected outputs

Summary report with paragraphs on views on strength/weaknesses in RFMOs, aspects where RFMOs are best suited, priorities for engagement and implications for ACAP RFMO Strategy. Drafted on Sunday 5th May (during workshop as far as possible) in order to be presented to the SBWG9 meeting on 6-7th May.

ANNEX 8. SUMMARY REPORT OF ACAP RFMO ENGAGEMENT WORKSHOP, 5 MAY 2019

An RFMO Strategy workshop was held on identifying the most effective and efficient ways to engage with tuna Regional Fisheries Management Organisations (RFMOs) to deliver on ACAP conservation objectives. The outputs of the workshop include this summary report, and an edited version the ACAP RFMO Strategy document reflecting key priorities.

Data presented to tuna RFMOs indicates that bycatch rates of ACAP species remain high. Moreover, tuna RFMOs have identified that bycatch data collection and reporting remain inadequate for monitoring bycatch levels. In February 2019, a global seabird bycatch estimation workshop was conducted as part of the Common Oceans Tuna Project. The analyses conducted at the workshop produced estimates of between 30,000 and 40,000 seabirds killed annually in the global pelagic longline fleets in the Southern Hemisphere. In light of this, 2019 is an important year to assess how best to engage and support pelagic longline fleets in order to reduce bycatch of ACAP species.

The core elements that the workshop covered were:

(i) Sharing views on strengths and weaknesses of using tuna RFMOs as a means to enhance bycatch reduction of ACAP species
(ii) Based on (i), identify the aspects of seabird bycatch mitigation that are best addressed via tuna RFMO structures versus via engagement at country or fleet level**.**
(iii) For those aspects identified in (ii), identify the most effective approaches to successful engagement with tuna RFMOs, including what types of meetings to engage with, what inputs will be most effective, who may be best placed to undertake which role.
(iv) Prioritise which tuna RFMOs to engage with.
(v) Provide feedback on the draft ACAP RFMO Strategy (SBWG9 Doc09), to be presented at the SBWG9 meeting.

Progress and challenges of engaging with tuna RFMOs to reduce albatross bycatch in global pelagic longline fisheries.

Five panellists representing a range of experiences shared their views on the progress/challenges/strengths/weaknesses of engaging with tuna RFMOs. The views from these presentations were used as a starting point for a group facilitated discussion that resulted in a SWOT style analysis (see below).

Strengths of ACAP engagement with the tuna RFMOs include that these organisations are the regulatory regime for seabirds on the High Seas. They are key forums for ACAP to present the science behind ACAP's Best Practice advice, and to engage with high seas fleets en masse. ACAP Parties can collaborate in joint efforts to achieve outcomes that would not be as effective from single CPCs. Despite these strengths a number of weaknesses within RFMOs in relation to seabird bycatch mitigation were noted. These include deficiencies in compliance monitoring of required bycatch mitigation measures, lack of penalties for non-compliance with such measures, bycatch and fishing effort data availability and quality issues, and overall low implementation levels for seabird bycatch mitigation measures. ACAP

representatives attend RFMO meetings. However, attending RFMO meetings is resource heavy for ACAP and ACAP Parties, due to the number of RFMOs and meetings within each RFMO each year. The consensus decision-making approach of RFMOs means that the pace of change is ordinarily very slow, and amendments to resolutions can take several years.

A number of opportunities were identified including the opportunity to begin engaging with RFMO Compliance Committees. Improvements to coordination between ACAP, ACAP Parties and Range States and key RFMO members with large quota holdings before and during meetings was identified as an opportunity, as well as ACAP collaborating with others working on other ETP bycaught taxa. It was also recognised that ACAP could communicate the bycatch problem better and could consider as a positive viewpoint birds saved rather than changes in bycatch rates.

Following identification of strengths and weaknesses of working with RFMOs, small group discussions identified potential actions for ACAP classified under key activities that within IPOA-Seabirds:

Regulations regarding use of mitigation measures and seabird bycatch reduction objectives- suggested actions fell under two categories;

i) Better demonstrating and communicating the conservation problem to RFMO members through communication with decision-makers, and visual aids such as infographics. It is key to consider the target audience when tailoring this communication. Improving the format and delivery of ACAP Best Practice advice, including the nature of the advice and when updates are suggested. ACAP Parties should work together to present advice and supporting evidence to RFMOs to increase the likelihood of adoption and strengthening of seabird resolutions. Finally, ACAP Parties should lead the way in adopting and using ACAP Best Practice advice in their nationally regulated fisheries.

ii) Better communicate the precautionary approach through identification of incentives to encourage compliance, e.g. punitive measures or market tools. Develop cogent counter arguments to respond to the reasons put forward that inhibit implementation of new or enhanced seabird bycatch mitigation measure, e.g. response to implementation issues concerning perceived effects on target catch, costs of implementation, and safety considerations.

Enhancing uptake by fleets (Education outreach vessels, strengthening compliance monitoring). The participants recognised that this is the key objective in achieving reductions in seabirds killed on the water, and this is also a very challenging area that ACAP has not recently done much work in. Priority actions were split into two categories

i) Education- ACAP could develop a curriculum and training materials on the implementation of measures in fisheries (in collaboration with other experts).This would need to be culturally sensitive and tailored to different fleets. Developing materials detailing case studies of success stories would be beneficial. Taking a more positive approach and considering number of birds saved rather than decreases in bycatch rates may be more tangible to most people. It was recognised that education of fishers alone does not increase uptake of measures, but compliance officer training could be a target audience for the resource materials, as seen during a training exercise in Cape Town. Another educational target could

be those who influence people with power to make changes e.g. specific scientists at RFMO meetings, government officials or high-profile figures in countries.

ii) Strengthening compliance monitoring. ACAP could engage with compliance procedures and mechanisms that would involve participation in compliance committee meetings of RFMOs. Innovations in compliance monitoring including use of AIS/VMS, transhipment observer monitoring, High Seas boarding and other remote monitoring were considered key in strengthening compliance. ACAP could revise advice to require use of a measure that can be monitored independently, such as night-setting via AIS/VMS, or alternatively could create advice for fleets on uptake of these innovations.

Enhancing bycatch data collection and reporting and periodic performance review. The key question here for ACAP is where priority should lie between data collection vs promoting uptake. Case studies that use the same language as fisheries managers could be developed and simulations/models on the effect of implementing measures in certain areas would provide information to relevant fishery scientists to understand the importance of responding to the conservation crisis affecting ACAP-listed species. ACAP could use funds for an external contractor to develop these simulations A review of all publicly available information from RFMOs on bycatch and specifically on gaps in reporting should be a priority. Standardising observer protocols and ensuring they are fit for purpose for monitoring seabird bycatch was recognised as key. Finally, taking a bottom-up approach and working with countries outside of an RFMO context could be more successful in increasing observer coverage rates.

General actions relevant to more than one category. The participants recognised the need to prioritise actions to a manageable number that will make the most impact, better communicate the bycatch problem and highlight positive incentives for states, e.g. adding value to catch via including seabird bycatch in certification standards, and generally improving ACAP messaging to the key players in the RFMOs (who are not necessarily ACAP Parties). This includes holding early pre-meetings to influence key players (RFMO members with large quota holdings) to lead or accept proposals. ACAP could collaborate with others working on bycatch species of other taxa, and improve coordination between ACAP and its Parties. Other advocacy could promote increasing ACAP's membership. Developing ACAP website/brochures/social media could improve messaging.

Feedback on RFMO Strategy

Following the discussion on potential activities/priorities for ACAP, a review of the priority actions currently detailed in the ACAP RFMO Engagement Strategy SBWG Doc 07 was conducted and a track changed version was created post workshop to be discussed by the SBWG under agenda item 14.1.

SWOT (Strengths, Weaknesses, Opportunities and Threats) style analysis for engaging with RFMOs

Strengths

- RFMOs are the regulatory regime
- ACAP and ACAP Parties collaborate in joint lobbying to achieve outcomes.
- Present the science behind the ACAP advice
- RFMOs are the only forum to engage the high seas fleets en masse.

Weaknesses/Threats

- Lack of compliance and compliance monitoring
- Parties not implementing best practice
- Inflexibility of adopting updated ACAP advice
- Data inadequate to answer questions i.e. to determine bycatch levels or rates
- Opposition to change by CPCs
- Slow process.
- Lack of penalties for RFMO members not implementing or enforcing measures
- RFMO fisheries scientists often want to treat seabird bycatch in the context of fish stock management - applying population level thresholds which trigger a response.
- Resource heavy for ACAP and ACAP Parties
- Not all ACAP Parties participate in RFMOs

Opportunities

- Improving compliance – engaging with compliance committees
- Investigate and develop resources for compliance monitoring
- Improving ACAP input to RFMOs
- Prioritising actions in the ACAP RFMO strategy
- Improved coordination between ACAP and parties before meetings
- Compliance assessment procedures/mechanisms and reporting
- Collaborate with other ETP bycatch work
- Consider birds saved rather than change in rates as a positive incentive
- Setting outcome-based objectives (at different scales)
- Think higher level
- Communicate bycatch problem better

Positive approach to helping achieve compliance

- Engage with RFMO compliance committees and other key mechanisms
- Ask them how ACAP can help

Develop package of materials for intersessional engagement of ACAP Parties and key fishing entities at RFMOs as above

- Get understanding from ACAP members as to implementation of best practice – might be a good secondment to interview and compile info

ANNEX 9. PROPOSED ACTIVITIES FOR ENGAGING WITH RFMOS AND CCAMLR[1]

1. Strengthen implementation of RFMO and CCAMLR seabird conservation measures (including the promotion of the ACAP best practice guidance).

WCPFC - Given the adoption in 2018 of the updated seabird CMM (CMM 2018-03), ACAP should help support efforts to facilitate the effective implementation of this measure, i.e. the proper use of the mitigation measures, as well as efforts to measure the efficacy of these measures by CPCs and WCPFC/SPC.

CCSBT - Advocate the application of additional seabird bycatch mitigation measures for SBT fisheries in high risk areas.

CCSBT - Investigate why the binding resolution adopted by CCSBT in 2018 states that a summary of information on mitigation use will be submitted to the Compliance Committee on an annual basis, but for information only.

CCSBT - Encourage and support further efforts to implement and improve mitigation measures used in SBT fisheries to reflect ACAP best practice advice. In this respect, ACAP should present its current best practice advice on reducing seabird bycatch in pelagic longline fisheries, and work with its Parties that are members of CCSBT to address the outcomes and recommendations coming out of the relevant seabird bycatch and risk assessment initiatives currently underway. The multi-year seabird strategy mooted at ERSWG12 is a potential mechanism to reflect the priority actions that need to be progressed.

IATTC - ACAP should continue to work intersessionally to engage with IATTC Members ahead of potential consideration of changes to Resolution C-11-02 in 2019 to identify any areas to help build consensus. High priority because it is the only tRFMO that still has the two-column approach for its entire Convention Area.

IATTC - ACAP should continue to engage with New Zealand on their global seabird bycatch risk assessment, with a view to supporting the presentation of a paper to the 2019 BWG and SAC to clearly outline the underlying need for improved seabird mitigation and improved data collection and reporting. This would provide underlying rationale for improvements to IATTC's current CMM.

IATTC - Subject to the outcomes of the IATTC BWG and SAC meetings in 2019, and the SBWG9/AC11 meetings, ACAP should prepare papers and presentations for the 2020 meetings of BWG and SAC to help CPCs understand the scientific basis for possible changes to mitigation options in Resolution C-11-02, as this has been raised by some IATTC CPCs as a requirement to justify any changes.

IATTC - ACAP, and in particular the SBWG, should consider how engagement with the Sustainable Fisheries Partnership may be used to facilitate mitigation uptake in fisheries posing bycatch risk to ACAP species

All RFMOs and CCAMLR - Continue to work through the RFMO and CCAMLR mechanisms to strengthen the bycatch mitigation measures in place for each of them. Ongoing efforts are

[1]Note that the full review and details of the actions are contained in the ACAP RFMO engagement strategy document (SBWG9 Doc 07 Rev 1)

required to encourage the RFMOs to update these measures to account for the recent (updates) in ACAP's advice. It is also important that ACAP continues to work through RFMO mechanisms to encourage better implementation of the seabird conservation measures currently in place. Although there are elements that will be similar, engagement approaches should be RFMO- and CCAMLR-specific, and should be strategic (by, for example, making use of opportunities such as formal reviews of seabird conservation measures, and avoiding a 'tinkering' approach in which proposals to make small changes are frequently presented).

CCAMLR - Work with CCAMLR Secretariat to respond to the periodic occurrence of seabird bycatch events. In previous seasons, this has been largely dominated by White-chinned Petrels although with isolated records of albatrosses caught.

2. Strengthen RFMO and CCAMLR bycatch data collection and reporting requirements, and the inclusion of appropriate seabird bycatch mitigation elements within RFMO and CCAMLR compliance monitoring. Focus ACAP inputs through the development of specific ACAP products

All RFMOs and CCAMLR - Continue to develop and update specific ACAP advice that serves to focus ACAP inputs and efforts to strengthen bycatch data collection requirements, and the inclusion of appropriate seabird bycatch mitigation elements within RFMO compliance monitoring. These should include:

- ACAP review and best practice advice documents on seabird bycatch mitigation (ensuring updated versions are made available).

  Consider including a short section in future ACAP seabird bycatch mitigation 'Best Practice Advice' documents outlining ACAP's Conflict of Interest policy.
- Best practice guidelines on data collection requirements for observer programmes - an update of SBWG4 Doc 26 Rev 1 and converting the document into a formal ACAP conservation guideline document, which should include guidelines for counting seabirds around vessels (see SBWG9 Doc 06).
- ACAP-BirdLife Mitigation Fact Sheets.
- ACAP seabird bycatch identification guide (ensuring updated versions are made available).
- ACAP de-hooking and safe release guidelines.
- Guidelines for seabird bycatch estimation (informed by the outcomes of the seabird bycatch assessment initiatives that are currently underway).
- Guide on the removal of entangled seabirds.

All RFMOs and CCAMLR - Continue to investigate and encourage the use of additional data collection opportunities and innovations to understand the extent of use of mitigation measures, such as through port and transhipment inspection procedures.

All RFMOs and CCAMLR - Consider how best to engage constructively on issues relating to compliance in respect of the use of seabird bycatch mitigation measures. This includes both compliance monitoring, and ways to help strengthen compliance. This is an issue in which ACAP has had limited involvement to date, but is clearly an area that requires urgent attention

3. Engage in RFMO and CCAMLR reviews of seabird measures

IOTC - Assist the Commission in updating Resolution 12/06 to bring it in line with the current ACAP advice.

IOTC - Help support IOTC work to advance innovation in seabird bycatch monitoring and mitigation, and associated capacity building, in relevant IOTC processes and implementation of current measures.

ICCAT - Continue to work with CPCs and ICCAT towards a revision of Rec 11-09 that is informed by the current ACAP best practice advice

ICCAT - Facilitate the submission and presentation of results from ongoing and additional studies on Hookpods and line weighting to the ICCAT SC-ECO

ICCAT - Participate in the ICCAT SC-ECO process to develop indicators (the ACAP focus would be on the seabird bycatch component) and an Ecosystem Report Card for ICCAT.

ICCAT - Engage with members not reporting compliance data to understand the main reasons for this.

ICCAT - Engage in intersessional work and discussions at the SC-Stats to review observer data collection forms (ST09).

WCPFC - Continue to engage with WCPFC, SPC, CPCs, and other organisations to improve data collection, reporting and assessment efforts regarding seabird bycatch and the effectiveness of mitigation methods

WCPFC - Help develop and support the proposed work to advance seabird bycatch monitoring and mitigation, and associated capacity building, in relevant French Polynesian fisheries, and help facilitate French funding via the ACAP National Contact Point for this work.

4. Other actions

SIOFA – Given the recent signing of the MoU between SIOFA and ACAP, and that SIOFA is in the process of developing mechanisms for issues that concern seabird monitoring and seabird bycatch including requirements for scientific observer programmes, and the collection of information on seabird abundance, bycatch and the use of bycatch mitigation measures, ACAP should look to provide some formal inputs to SIOFA regarding seabird conservation and management measures. This should include working towards a binding seabird conservation measure that is informed by ACAP best practice and is aligned with measures in SPRFMO and other comparable bodies.

SEAFO – Maintain a watching brief.