Agreement on the Conservation of Albatrosses and Petrels

Ninth Meeting of the Seabird Bycatch Working Group

Florianópolis, Brazil, 6 - 8 May 2019

Drivers and barriers in the uptake of seabird bycatch mitigation measures and related conservation actions

SBWG intersessional group

SUMMARY

One of the main objectives of the Seabird Bycatch Working Group is to help facilitate and support efforts to assess, mitigate and reduce seabird bycatch. To date, the mechanisms used by ACAP to drive the uptake of seabird bycatch mitigation have been indirect, through the provision of advice and resources on best practice mitigation, and as a source of knowledge on all things albatross and petrel.

Numerous case studies on mitigation uptake have been summarised, and several others are presented to SBWG9 as separate papers. The purpose of this paper is to inform discussion at SBWG9 to identify what the drivers and barriers in the uptake of seabird bycatch mitigation are, which are the most important drivers and barriers, and what interventions and approaches have been used to promulgate drivers or overcome barriers. A number of conclusions based on the case studies reviewed in this paper are provided.

This paper also identifies some potential mechanisms through which ACAP could drive increased seabird bycatch mitigation. These form a starting point for SBWG9 to develop recommendations to AC11 for actions that ACAP could take to achieve the ultimate goal of this process, improved uptake of seabird bycatch mitigation measures in those fisheries overlapping with albatrosses and petrels.

RECOMMENDATIONS

That the Seabird Bycatch Working Group:

1. Consider the case studies reviewed in this paper, submitted in other papers under this agenda item, and identify other relevant examples.
2. Review the drivers and barriers of seabird bycatch mitigation uptake outlined in this paper and identify other drivers and barriers based on knowledge not captured by the case studies reviewed in this paper.
3. Consider which are the key drivers and barriers of seabird bycatch mitigation uptake that ACAP should focus attention on in order to facilitate increased uptake of effective seabird bycatch mitigation to achieve a favourable conservation status of ACAP-listed species.
4. Identify mechanisms that ACAP could use to promulgate drivers or overcome barriers to seabird bycatch mitigation uptake.

Factores que influyen a favor y en contra de la adopción de medidas de mitigación de la captura secundaria de aves marinas y medidas de conservación afines

RESUMEN

Uno de los objetivos principales del Grupo de Trabajo sobre Captura Secundaria de Aves Marinas es ayudar a facilitar y respaldar los esfuerzos para evaluar, mitigar y reducir la captura secundaria de aves marinas. Hasta la fecha, los mecanismos usados por el ACAP para generar la adopción de medidas para mitigar la captura secundaria de aves marinas han sido indirectos, ofreciendo asesoramiento y recursos sobre mejores prácticas de mitigación, como fuente de conocimiento integral sobre albatros y petreles.

Se resumieron numerosos estudios de caso sobre la adopción de medidas de mitigación, y muchos otros se presentan en la GdTCS9 como documentos separados. La finalidad de este documento es aportar información para los debates de la GdTCS9 a fin de identificar qué factores influyen a favor y en contra de la adopción de medidas de mitigación de la captura secundaria de aves marinas —que son los factores más importantes en uno u otro sentido— y qué intervenciones y enfoques se han usado para divulgar los factores a favor o sortear los factores en contra. Se ofrecieron una serie de conclusiones basadas en estudios de caso revisados en este documento.

En el presente documento también se identifican algunos de los posibles mecanismos a través de los cuales el ACAP podría impulsar una mayor mitigación de la captura secundaria de aves marinas. Esos mecanismos son el puntapié inicial para que el GdTCS9 elabore las recomendaciones para la Undécima Reunión del Comité Asesor (CA11) que el ACAP podría adoptar para alcanzar el objetivo último de este proceso: una adopción mejorada de las medidas de mitigación de captura secundaria de aves marinas en las pesquerías que tienen interacción con albatros y petreles.

RECOMENDACIONES

Se recomienda al Grupo de Trabajo sobre Captura Secundaria de Aves Marinas realizar las siguientes acciones:

1. Considerar los estudios de caso revisados en este documento, presentados en este punto de la agenda en otros documentos, e identificar otros ejemplos pertinentes.
2. Revisar los factores que influyen a favor y en contra de la adopción de las medidas de mitigación de la captura secundaria de aves marinas descriptos en este documento e identificar otros factores a favor y en contra con base en el conocimiento que no haya sido relevado por los estudios de caso revisados aquí.
3. Considerar cuáles son los factores que influyen a favor y en contra de la adopción de medidas de mitigación contra la captura secundaria de aves marinas en los que debería centrar su atención para facilitar una mayor adopción de medidas de mitigación de la captura secundaria efectivas para lograr un estado de conservación favorable de las especies amparadas por el ACAP.

4. Identificar los mecanismos que el ACAP podría usar para divulgar los factores a favor o sortear los factores en contra de la adopción las medidas de mitigación de la captura secundaria de aves marinas.

Facteurs favorisant ou entravant la mise en œuvre des mesures d'atténuation de la capture accessoire d'oiseaux de mer et des actions de conservation associées

RÉSUMÉ

L'un des objectifs principaux du Groupe de travail sur la capture accessoire des oiseaux de mer est de promouvoir et de soutenir les efforts visant à évaluer, atténuer et réduire les captures accessoires d'oiseaux marins. À ce jour, les mécanismes utilisés par l'ACAP pour stimuler l'adoption des mesures d'atténuation de la capture accessoire des oiseaux de mer sont indirects, grâce à des conseils et des ressources sur les bonnes pratiques en la matière, et comme sources de connaissances sur tout ce qui concerne les albatros et les pétrels.

De nombreuses études de cas sur l'adoption de mesures d'atténuation ont été synthétisées, et plusieurs autres sont présentées au GTCA9 en tant que documents séparés. L'objet du présent document est d'alimenter les discussions lors du GTCA9 visant à identifier les facteurs favorisant et entravant l'adoption des mesures d'atténuation de la capture accessoire, les facteurs les plus importants, et de déterminer les interventions et les approches utilisées pour renforcer les facteurs favorisants et lever les obstacles à l'adoption. Une série de conclusions fondées sur les études de cas abordées dans le présent document sont fournies.

Le présent document identifie également les mécanismes qui pourraient permettre à l'ACAP de renforcer l'atténuation des captures accessoires des oiseaux de mer. Ceux-ci constituent le point de départ des recommandations du GTCA9 au CC11 quant aux actions que l'ACAP devrait entreprendre afin d'atteindre le but ultime de ce processus, l'adoption accrue des mesures d'atténuation de la capture accessoire dans les pêcheries dont les opérations chevauchent les zones où se trouvent des albatros et des pétrels.

RECOMMANDATIONS

Que le Groupe de travail sur la capture accessoire des oiseaux de mer :

1. Examine les études de cas abordées dans le présent document, soumises dans d'autres documents au titre de ce point de l'ordre du jour, et identifie d'autres exemples pertinents.
2. Examine les facteurs favorisant et entravant l'adoption de mesures d'atténuation des captures accessoires repris dans le présent document et identifie d'autres facteurs (positifs et négatifs) sur la base de connaissances qui ne se trouvent pas dans les études de cas présentées ici.

3. Détermine quels facteurs favorisant et entravant l'adoption des mesures d'atténuation de la capture accessoire devraient retenir l'attention de l'ACAP afin de renforcer l'adoption de mesures d'atténuation efficaces pour atteindre un statut de conservation favorable pour les espèces inscrites à l'ACAP.
4. Identifie les mécanismes que pourrait utiliser l'ACAP afin de renforcer les facteurs favorisants et lever les obstacles à l'adoption des mesures d'atténuation.

1. BACKGROUND

Incidental fisheries mortality, or bycatch, is the primary threat to most ACAP species, and remains one of the main areas of focus for the Agreement. One of the main objectives of the Agreement's Seabird Bycatch Working Group is to help facilitate and support efforts to assess, mitigate and reduce seabird bycatch.

AC9 indicated that it would be instructive to investigate the extent to which ACAP's best practice advice on reducing seabird bycatch in fisheries is being adopted and effectively implemented, and to investigate factors that help or hinder the adoption and use of these best practice measures. The ultimate goal of this would be to help identify ways to improve the uptake of best practice mitigation measures in those fisheries overlapping with albatrosses and petrels.

This work was initiated ahead of SBWG8, as described in SBWG8 Doc 14. In that paper it was identified that although fisheries around the world vary in their gear and operational attributes and experience a range of environmental conditions, there are some generic steps and actions that constitute important elements of a seabird bycatch reduction or avoidance strategy. These were outlined in order to provide a basis for the investigation of the factors driving or hindering the implementation of seabird bycatch mitigation measures and related conservation actions. Six elements were identified:

- Robust assessment of incidental mortality of seabirds in fisheries;
- Data collection and the implementation of an onboard observer scheme;
- Prescription, adoption and implementation of effective seabird bycatch mitigation measures;
- Education, training and publicity;
- Research and development; and
- Setting explicit targets (limits) and timelines

At SBWG8 it was noted that the main focus of the Working Group has been on research and the development of advice regarding technical bycatch mitigation measures. This research has been critical in providing evidence-based solutions for mitigating seabird bycatch. However, there remains a gap between the research and effective implementation of bycatch mitigation strategies. Further technical research is unlikely to bridge this gap, and efforts are urgently needed to understand better how best to link 'knowing' and 'doing'. Much more is required than merely publishing research in high-impact journals and presenting research

and advice at relevant fora in the hope that outcomes will trickle down to policy makers, managers and fishers. The Working Group agreed more work was needed to understand what mitigation measures are being used in priority fisheries, how they conform with ACAP Best Practice Advice, and if not the reasons for not conforming. The investigation could usefully solicit this information from ACAP Party fisheries in the first instance. The Working Group also noted the importance of expanding the social dimension of work on seabird bycatch mitigation, and adopting a transdisciplinary approach.

2. PURPOSE

This paper, alongside other papers submitted under this Agenda Item, is intended to guide discussion by the Working Group towards reaching an assessment of:

- what the drivers and barriers in the uptake of seabird bycatch mitigation are;
- which are the most important drivers and barriers; and
- what interventions and approaches have been used to promulgate drivers or overcome barriers.

Based on this assessment, recommendations to AC11 should be identified, where possible, on:

- any potential actions identified that ACAP could consider taking or supporting to enhance the uptake of best practice seabird bycatch mitigation; and
- further research or other work to better understand the drivers and barriers in seabird bycatch mitigation.

3. CASE STUDIES

3.1. Published case studies

A range of workshops and case studies have been reported, both to SBWG and in the literature. These experiences informed the direction of SBWG's work on the drivers and barriers to seabird bycatch mitigation uptake, and provide essential context. Key reports include:

Eayrs S & Pol, M. 2018. The myth of voluntary uptake of proven fishing gear: investigations into the challenges inspiring change in fisheries. ICES Journal of Marine Science, doi:10.1093/icesjms/fsy178

Birdlife International 2017. Albatross Task Force: 2018-2020. Eighth Meeting of the Seabird Bycatch Working Group. Wellington, New Zealand. SBWG8 Inf 11.

Goad G & Ramm K. 2017. Encouraging uptake of mitigation measures in a disparate small vessel fleet. Eighth Meeting of the Seabird Bycatch Working Group. Wellington, New Zealand. SBWG8 Inf 19.

Hall M, Gilman E, Minami H, Mituhasi T, Carruthers E (2017) Mitigating bycatch in tuna fisheries. Reviews in Fish Biology and Fisheries doi 10.1007/s11160-017-9478-x

Melvin EF & Parrish JK (Eds). 2001. Seabird Bycatch: Trends, Roadblocks, and Solutions. University of Alaska Sea Grant, AK-SG-01-01, Fairbanks. Available here

Royal Society for the Protection of Birds (RSPB) and BirdLife International. 2017. Towards seabird-safe fisheries: global efforts & solutions. Available here

Squires D. & Garcia, S. 2018. The least-cost biodiversity impact mitigation hierarchy with a focus on marine fisheries and bycatch issues. Conservation Biology, Volume 32, No. 5, 989–997 doi: 10.1111/cobi.13155

3.2. Additional case studies reported to SBWG9

A range of further material describing case studies has been submitted to SBWG9 to inform discussion on the drivers and barriers to seabird bycatch mitigation uptake. These include both Working Papers and Information Papers:

Gilman & Melvin. Recommendation on ACAP actions to contribute to Marine Stewardship Council assessment and management of seabird bycatch in marine capture fisheries. SBWG9 Doc 12.

Melvin et al. Lessons from seabird conservation in Alaskan longline fisheries: A case study. SBWG9 Doc 11.

Prince et al. A new method using AIS data to obtain independent compliance data to determine night setting use at sea. SBWG9 Doc 18.

Suazo et al. The role of small-scale fisher's experiences on non-target taxa conservation in Chile. SBWG9 Doc 13.

Suazo et al. Chile-Argentina: An at-sea classroom for training and expanding implementation of mitigation in trawl fisheries. SBWG9 Doc 14.

Crespo & Crawford. Bycatch and the Marine Stewardship Council (MSC): A review of the efficacy of the MSC certification scheme in tackling the bycatch of non-target species. SBWG9 Inf 28.

Jannot et al. Summary Report of the U.S. West Coast and Alaska Trawl Fisheries Seabird Cable Strike Workshop. SBWG9 Inf 20.

Molloy. Seabird Smart Assurance Scheme. SBWG9 Inf 04.

New Zealand. Seabird bycatch mitigation observations on the high seas. SBWG9 Inf 19.

Seco Pon et al. 2018. Certification schemes in Argentine Fisheries: Opportunities and Challenges for Seabird Conservation. SBWG9 Inf 11.

The wide-ranging nature of considerations related to the drivers and barriers to seabird bycatch mitigation uptake mean that material considered in other SBWG9 agenda items will also provide context. This includes reported levels of mitigation use by parties (Jimenez et al. ACAP seabird bycatch performance indicators and reporting framework. SBWG9 Doc 05) and progress across Regional Fisheries Management Organisations (Wolfaardt et al. Review of ACAP RFMO Engagement Strategy. SBWG9 Doc 06).

3.3. Review of case studies where compliance processes are a key driver

Table 1 lists examples of longline fisheries that have adopted effective seabird conservation measures and the reasons (drivers) underpinning the adoption of the measures. In each case the causal pathway towards full compliance involves i) very high levels of surveillance (most typically by onboard independent observers) and reporting, and ii) the existence of enforceable penalties and punitive incentives for the non-use or ineffective use of required

seabird conservation measures. The incentives in the table are classified as operational (e.g., imposed performance standards of fishing gear), economic/existential (e.g., desire to avoid a reduction in income or cancellation of fishing licence), political (desire by States to avoid being singled out as non-compliant) and reputational (e.g., desire to maintain sustainability accreditation; desire to avoid adverse publicity by media). The two key elements of the causal pathway (surveillance and penalties) have driven the development and implementation of gear and practices that are demonstrably safe to seabirds, and provided the motivation for the continued use of such gear and practices.

The causal pathway mentioned above can be described pithily as the 'carrot-and-stick approach'. The carrot relates to the right to continue fishing and the stick is the potential loss of fishing privilege for the non-use or improper use of seabird conservation measures. Assuming the examples listed in Table 1 constitute a complete (or near complete) list of successful case studies, the natural conclusion is that absent high levels of surveillance and penalties for non-compliance the likelihood is that advice by ACAP will continue to be ignored and seabird mortality levels in fisheries will remain unchanged.

Table 1. List of examples where high levels of surveillance (e.g., by onboard independent observers or electronic monitoring systems) coupled with enforceable penalties for non-compliance (punitive incentives) have been instrumental in driving the adoption of effective seabird conservation measures in longline fisheries. Examples of cachalotera system/toothfish and Australian tuna (in 2008, see below) not subjected to high surveillance levels but are included to demonstrate the importance of punitive incentives in driving change. Example in last row based on speculation and is included for reference. Two examples from trawl fisheries included for comparison. Contributors listed at bottom. Modified from Doc 19 SBWG8.

Fishery and Management regime	**Surveillance using independent methods**	**Mitigation measures in force**	**Punitive incentives exist?**	**Types of incentives/drivers**	**Causal pathways and actions**	**Seabird response/outcome (if known)**	**Assumed reason(s) for fisher response**
Ross Sea (Antarctica), Toothfish, Longline (CCAMLR)	100% (two observers if feasible) (1)	Scaring line, line weighting, (min. sink rate standard), nil offal discharge south of 60 S, bird exclusion device (BED) encouraged on hauls	Yes	Operational + political in CCAMLR (provisions in conservation measures). MSC certification.	Min. sink rate imposed led to external weights led to development of integrated weight longline.	None locally (absence of longline-vulnerable seabirds) but likely very positive elsewhere (2)	Pragmatism. Desire to protect fishing rights and to maintain MSC accreditation. Seabird mitigation measures were used to separate fully compliant from less compliant operators.
Kerguelen and Crozet, Toothfish, Longline (CCAMLR)	100%	Minimum of four scaring lines (mandated by national regs.), line weighting, night setting, nil offal discharge during setting and hauling,, six week closed season in Kerguelen EEZ to protect seabirds.	Yes	Political in CCAMLR for government. French Southern lands MPA incentives. Third party certification (MSC) and French government involvement for industry.	i) Initially, political in CCAMLR. ii) Action plan aimed at reducing seabird by-catch presented in CCAMLR- XXVII (fishing rules and good practices); iii) Fishing quota allocations by French government based on the number of bird killed; iv) MSC certification (reputational	Mortality (extrapolated) fell from ~12,500 birds/year (3) to <50 in 2018 (4)	Pragmatism. Desire to protect reputation, fishing rights, quota allocation, MSC certification and Monterey Bay Aquarium rating (increases the market value of toothfish).
South Georgia, Toothfish Longline (CCAMLR)	100% (two observers if feasible) (1)	Seasonal closures, scaring lines, night setting, nil offal discharge on line hauling side, line weighting.	Yes	Political in CCAMLR/existential (provisions in conservation measures). Reputational - to obtain	i) High # of fatalities led to summer closure of fishing grounds. Improved line weighting likely helped. ii) High hook incidence in wandering albatross chicks raised at	Mortality fell from ~ 5,700 birds/year to <20 (4,5). Amount of fishing gear found associated with albatrosses declined.	Pragmatism. Desire to protect fishing rights and maintain MSC accreditation (addressing hook discarding a condition of reaccreditation)

				and maintain MSC accreditation.	CCAMLR and by MSC. Vessel-specific marks on hooks imposed as license condition.		
Heard Island, Toothfish, Longline (CCAMLR)	100% (two observers if feasible) (1)	Nil offal discharge, line weighting, seasonal closures, scaring lines, three bird bycatch limit applied to extensions to fishing season	Yes	National (Australian) regulations, then international as taken into CCAMLR. Initial requirements stem from the Australia's Threat Abatement Plan (TAP) for seabirds. Good ideas adopted by CCAMLR.	No longline fishing permitted initially as result of TAP, requiring trials for three years to demonstrate low incidence of seabird bycatch.	Mortality levels remain at very low levels, even with significantly increased numbers fishing vessels and hooks in the fishery.	Pragmatism – strong incentive to innovate in early stages, then incentives to maintain fishing rights and access. MSC and MBASWP accreditation/approval also important.
Heard Island, Mackerel Icefish, Demersal Trawl (CCAMLR)	100% (two observers if feasible) (1)	Net binding, net weighting, no net sonde cables, removal of stickers, nil offal discharge setting and hauling, low lighting.	Yes	Operational + political in CCAMLR (provisions in conservation measures). MSC certification.	Govt/industry/CCAMLR cooperative research led to design on mitigation measures such as net binding and weighting. Seabird bycatch limit of 20 seabirds/vessel/season.	Unknown but likely positive	Pragmatism. Desire to protect fishing rights.
South Georgia, Mackerel Icefish, Midwater Trawl (CCAMLR)	100% (two observers if feasible) (1)	Net binding, net weighting, no net sonde cables, removal of stickers, nil offal discharge setting and hauling, low lighting, setting slack net encouraged (to expedite sinking).	Yes	Operational + political in CCAMLR (provisions in conservation measures). MSC certification.	Govt/industry/CCAMLR cooperative research led to design on mitigation measures such as net binding and weighting. Seabird bycatch limit of 20 seabirds/vessel/season.	Reduced mortality rates in last 10 years. Coincident with reduced fishing activity in the fishery.	Pragmatism. Desire to protect fishing rights.
Macquarie Island, Toothfish, Longline (Australia)	100% (two observers if feasible) (1)	Nil offal discharge, line weighting, seasonal closures, scaring lines, seabird bycatch limits (see column six).	Yes	National regulations under TAP. Third party MSC and MBASWP.	Trials required following Heard Island experience. Same mitigation measures applied. Seabird bycatch limits (n= one bird) apply to: Wandering Albatrosses, Grey-headed Albatrosses, Black-browed Albatrosses, Grey Petrels and	Mortality levels remain at zero or near zero seabirds.	Pragmatism. Desire to protect fishing rights.

					Soft-plumaged Petrels. Vessels must immediately cease fishing for the remainder of the season if an individual bird of these species is caught.		
Chile, Toothfish, Cachalotera / Chilean System, (Chile)	??	The use of the Chilean system is recognised as mitigation measure in the Chilean NPOA-Seabirds for the reduction of seabird bycatch in demersal longline targeting on Patagonian toothfish	Yes	Economic/existential (see next column).	By-product of gear changes to reduce toothfish depredation by toothed whales.	Mortality fell from ~ 1,500 birds/year to zero (6,7).	Pragmatism – strong economic incentive to innovate to minimise loss of toothfish to toothed whales. Positive effect on seabirds an unintended consequence.
Alaskan Groundfish. (sablefish, Pacific halibut, turbot and Pacific cod) (USA)	0 to 300% depending on vessel length and processing type	Bird scaring lines with material and performance standards	Yes	Endangered Species Act (ESA) fleetwide limit on short-tailed albatross takes (six birds in two years for groundfish longline and trawl combined). MSC certified.	ESA limits exceeded could interrupt fishery and/or could mandate additional mitigation measures. Collaborative research with industry led to bird scaring lines identified as best practice. Provision of scaring lines free-of-charge.	Albatross bycatch rates decreased by 89% and other birds by 78% since bird scaring line adoption.	Pragmatism. Desire to continue fishing uninterrupted and to maintain market access.

Hawaii pelagic longline deep-set and shallow-set fisheries (8), (USA)	Shallow-set fishery 100%; Deep-set fishery ~20%).	Shallow set: either (i) night setting + blue dyed and thawed bait + 'strategic' offal discards, or (ii) side set + bird curtain + line weighting. Deep set: N of 23 deg. N either (i) line weighting + blue dyed and thawed bait + 'strategic' offal discards, or (ii) side set + bird curtain + line weighting.	Yes, regulations legally binding	Risk of penalties from identified infraction and enforcement actions, market reputational risk with respect to seafood sustainability programs, individual operators' values.	Govt/industry cooperative research, led to adoption of govt. regulations with two options for compliance, with additional cooperative research that led to periodic regulatory amendments.	Shallow-set fishery: Approx. 90% reduction in observed seabird catch rate. Deep-set fishery: Initial decline in seabird catch rate following adoption of bycatch regulations, followed by recent spike in seabird catch rate due in part to changes in the temporal and spatial distribution of fishing effort, increase in the number of albatrosses attending vessels, and a shift from more effective combination of seabird mitigation methods (e.g., side setting) to less effective suite of methods that includes blue-dyed bait.	Both fisheries: High levels of compliance to regulations likely due to a desire by owners and fishers to avoid penalties for non-compliance, and because some operators have a strong conservation ethic.
Australia, tuna, high latitude sector (pertinent to a breach of regs. In 2008) (Australia)	In 2008: 5% (see column six) Since 2015: 100% ('e' monitoring) south of 25th parallel).	Present time, relevant south of 25 S: Line weighting (60 g/3.5 m or 40 g/1 m), nil offal discharge during line setting, and either a) a scaring line or b) night setting. Other adaptive manag. strategies available as required (scaring lines, BED and/or offal discharge manag., night setting, area closures.	Yes (in 2008 and present)	Operational, economic - risk of penalties if bycatch rate of 0.05 birds/'000 hooks breached. Third party actions of an NGO useful in galvanizing attention (preceding 2008).	In 2008: enforceable seabird bycatch rate (0.05/'000 hooks) breached, high latitude sector of fishery closed for day setting.	Effect of closure and subsequent developments (see next column) on seabird populations unknown but likely positive.	Pragmatism. The day setting closure in 2008 led to line weighting trials, then to the development of snoods with short leaders (+ lumo sliding leads) to expedite initial sink rates (9).
Distant water tuna vessels in EEZ fisheries	100%	Subject to national regulations.	Yes	Economic/existential	Enforceable seabird bycatch limits (S. Africa).	Unknown but likely positive	Pragmatism. Desire to be able to fish

(e.g., South Africa) (Nation States)		At-sea reporting on seabird bycatch to facilitate rapid identification of reaching bycatch limits.					
Distant water tuna vessels fishing on high seas (RFMO)	0%?	Not known	None known	None known	Not applicable	None of the above. Likely continued high mortality rates	Not known

(1) In accordance with the CCAMLR Scheme of International Scientific Observation; (2) Inferred from Robertson et al., 2006; (3) Delord et al., 2005; (4) SC-CCAMLR 2018; (5) Croxall 2008; (6) Moreno et al., 2008; (7) Robertson et al., 2014; (8) Gilman and Ishizaki, 2019; (9) Robertson et al., 2013

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3.4. Conclusions

Through consideration of the case studies identified in this paper, we conclude that creating effective drivers will likely be the best way to overcome barriers to the uptake.

Compliance processes have been shown to be a strong driver in several fisheries where good seabird bycatch reductions have been achieved, such as in various CCAMLR fisheries where there are high levels of monitoring and enforceable penalties (Table 1).

Fishery certification schemes can be an important driver as fisheries will be required to demonstrate implementation of mitigation as required for certification.

The adoption of an ecosystem approach to fisheries management can act as a driver by embedding seabird bycatch mitigation as an essential component of fisheries management.

Mitigation advice focussed at the vessel or fleet in question may have a greater likelihood of adoption as it will consider operational or other factors related to the vessel or fleet, and thus avoid potential barriers associated with the implementation of generic advice.

Publicity, either avoiding bad press or generating positive messaging, whilst hard to quantify, may play an important role in shaping fishing industry attitudes towards mitigation and seabird bycatch.

Engagement, and the creation of drivers and motivators, needs to be at multiple levels, from policy makers and fisheries managers through to deck-hands. Indeed, it is deck-hands who will actually deploy mitigation measures and who may not have sufficient capacity, interest or motivation for additional work. Engaging across all levels will help overcome any gap between decisions that are made by a management organisation and what happens on the water.

Education for fishermen is an essential tool as part of any initiative to introduce or improve seabird bycatch mitigation in a fishery but is not in itself a driver.

4. ACAP INTERVENTIONS

To date, the mechanisms used by ACAP to drive the uptake of seabird bycatch mitigation have been indirect. ACAP's strengths have been i) the provision of advice and resources on best practice mitigation, and ii) as a source of knowledge on all things albatross and petrel. The Seabird Bycatch Working Group routinely reviews the scientific literature on seabird bycatch mitigation to develop and update advice regarding best practices for reducing seabird bycatch. This advice has been well developed for pelagic longline, demersal longline and trawl fisheries, and is reviewed and updated by the Seabird Bycatch Working Group at each of its meetings. Further, a toolbox of guidelines for artisanal fisheries and other small-scale fisheries is under development (SBWG9 Doc 21). ACAP has also been actively pursuing a strategy to engage with RFMOs as described in SBWG9 Doc 07, and ACAP advice to RFMOs has played an important role in the development of current conservation and management measures now in place across all major tuna-RFMOs.

Potential areas in which ACAP could drive increased seabird bycatch mitigation include through:

- engaging with fishery certification schemes to advise on appropriate seabird bycatch mitigation requirements;
- increased engagement with RFMOs with a focus on improved uptake of seabird bycatch mitigation by relevant fleets;
- expanding the range of advice provided and advocated to specifically include mitigation use compliance verification;
- increased efforts to publicise the importance and need for mitigation uptake by highlighting the continuing deteriorating conservation status of so many populations of ACAP-listed species; and
- engaging with fishing vessel manufacturers to provide built-in mitigation options.

In taking forward these or other recommendations, it is important to consider how to create capacity to achieve results. For example, it may be necessary to create a contract position, or use secondments, to provide adequate capacity to explore ways to engage with others on the development of drivers. Given the constraints on any new resource it will also be important to continue to apply prioritisation of ACAP's engagement on mitigation uptake, to create change in those fisheries that have the highest levels of bycatch.