Agreement on the Conservation of Albatrosses and Petrels

Ninth Meeting of the Seabird Bycatch Working Group

Florianópolis, Brazil, 6 - 8 May 2019

'Toolbox' template for mitigation advice in artisanal and small-scale fisheries

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SUMMARY

It was agreed at SBWG6 to work towards a model of advice that involves the development of a 'toolbox' of effective mitigation methods for artisanal and small-scale fisheries, rather than a more prescriptive list. We provided the first step of this process to develop a 'toolbox' template at SBWG7, by providing two templates which included some examples to 'populate' the toolbox to illustrate how it could work in practice. For industrial trawl and longline fisheries, ACAP distils clearly defined best practice advice. A major challenge with the 'toolbox' approach is how advice on the adequacy of each mitigation method included can be clearly and simply communicated. Following discussion and recommendations from SBWG7 and SBWG8 we have further developed the preferred toolbox template, refined the categorisation, and populated the template more widely with relevant mitigation techniques.

RECOMMENDATIONS

1. The Working Group review and endorse the proposed mitigation 'toolbox' template for future use in providing mitigation advice for artisanal and small-scale fisheries.
2. The Working Group review and endorse the categorisation of advice for each mitigation method included in the 'toolbox'.
3. The Working Group identify additional possible mitigation methods to populate the 'toolbox'.

Plantilla de herramientas para brindar recomendaciones sobre medidas de mitigación en pesquerías artesanales y en pequeña escala

RESUMEN

En la GdTCS6, se acordó trabajar en pos de un modelo para la formulación de recomendaciones que suponía la creación de un conjunto de herramientas en forma de medidas efectivas de mitigación para las pesquerías artesanales y en pequeña escala, en lugar de elaborar una lista más prescriptiva. Facilitamos el primer paso de este proceso de creación de una plantilla de herramientas en la GdTCS7 brindando dos plantillas que incluyeron algunos ejemplos para expandir las herramientas, a fin de demostrar su posible funcionamiento en la práctica. El ACAP sintetiza las recomendaciones de mejores prácticas claramente definidas para las pesquerías industriales de arrastre y palangre. Uno de los mayores desafíos respecto de la creación de este conjunto de herramientas es lograr que las recomendaciones sobre la pertinencia de los métodos de mitigación incluidos se realicen de manera clara y simple. Tras el debate entablado y las recomendaciones formuladas durante las GdTCS7 y GdTCS8, perfeccionamos la plantilla de herramientas preferida, mejoramos la categorización y completamos la plantilla con técnicas de mitigación pertinentes.

RECOMENDACIONES

1. Que el Grupo de Trabajo revise y ratifique la plantilla de herramientas de mitigación propuesta, a fin de utilizarla en el futuro para brindar recomendaciones sobre medidas de mitigación para pesquerías artesanales y en pequeña escala.
2. Que el Grupo de Trabajo revise y ratifique la categorización de las recomendaciones para cada método de mitigación incluido en las herramientas.
3. Que el Grupo de Trabajo identifique posibles métodos de mitigación adicionales para expandir las herramientas.

Modèle de « Boîte à outils » en matière de méthodes d'atténuation applicables à la pêche artisanale et à petite échelle

RÉSUMÉ

Le GTCA6 était convenu d'œuvrer à l'élaboration d'un modèle d'avis destinés aux pêcheries artisanales et à petite échelle impliquant la création d'une « boîte à outils » contenant des méthodes d'atténuation efficaces, au lieu d'adopter une approche prescriptive. La première étape du processus de création d'un modèle de « boîte à outils » a été présentée au GTCA7 en fournissant deux modèles, accompagnés d'exemples de contenus qui avaient pour but d'illustrer le fonctionnement de la « boîte à outils » dans la pratique. L'ACAP diffuse des avis de bonne pratique précis et bien définis aux pêches

industrielles de chalutage et palangrières. L'une des grandes difficultés de la méthode de la « boîte à outils » réside dans la communication simple et efficace des avis sur l'adéquation des différentes méthodes d'atténuation qu'elle contient. Dans la foulée des délibérations et recommandations du GTCA7 et du GTCA8, nous avons amélioré le modèle de « boîte à outils » sélectionné, affiné les catégories, et doté le modèle d'autres techniques d'atténuation pertinentes.

RECOMMANDATIONS

1. Le Groupe de travail examine et approuve le modèle proposé de « boîte à outils » de méthodes d'atténuation en vue de son utilisation future dans la formulation d'avis sur l'atténuation auprès des pêches artisanales et à petite échelle.
2. Le groupe de travail examine et approuve les catégories d'avis relatifs à toutes les méthodes d'atténuation comprises dans la « boîte à outils ».
3. Le Groupe de travail identifie d'autres méthodes d'atténuation éventuelles qui seront ajoutées dans la « boîte à outils ».

1. INTRODUCTION

ACAP has started focussing greater attention on the consideration of seabird bycatch in artisanal and other small-scale fisheries. There are a number of challenges associated with developing advice for the mitigation of seabird bycatch in small-scale fisheries. These include the diverse nature of the gear and methods used by these fisheries, the smaller size of vessels, reduced size and capacity of crew, and lack of mechanisation. All of these, and other, factors necessitate a more flexible and less prescriptive approach to providing advice on seabird bycatch mitigation for small-scale fisheries than has been adopted for industrial fisheries. Consequently, it was agreed at SBWG6 to work towards a model of advice that involves the development of a 'toolbox' of effective mitigation methods, rather than a more prescriptive list. It was recommended at SBWG6 that a useful first step of this process would be to develop a 'toolbox' template, and to include some examples to 'populate' the toolbox and test how it could work in practice. At SBWG7, we provided two possible templates and included some examples to 'populate' the toolbox to illustrate how it could work in practice. Following discussion and recommendations from SBWG7 and SBWG8 we have further developed the preferred toolbox template, refined the categorisation, and populated the template more widely with relevant mitigation techniques.

2. DEVELOPMENT OF THE TOOLBOX

Refinements to the toolbox template can be found in Table 1. We have begun populating the tables with a range of examples of mitigation trials and technologies. We have revised the categorization of these example to specify if they (1) reduced bycatch of ACAP species, (2) reduced seabird bycatch but not of ACAP listed species, (3) reduced bycatch of other marine fauna, like marine turtles but not of seabirds, (4) are currently undergoing testing, or (5) were tested but showed no reduction in bycatch.

We have included non-seabird specific mitigation examples and examples from commercial or industrial fisheries because specific trials conducted in small-scale fisheries and directed at reducing seabird interactions are rare, but some of the bycatch mitigation principles (e.g. increasing net visibility) may still apply in a small-scale fishery setting to reduce seabird interactions. Methods developed and tested in small-scale fisheries are highlighted, as it is unknown how practical mitigation tested in commercial settings will be in SSF operations. We have also included other examples of mitigation methods that have been tested or shown to reduce bycatch of other marine fauna (e.g. sea turtles) or that have been shown to be effective at reducing seabird bycatch but with commercial or industrial fisheries. We have also made some refinements to the categorization to reflect this broader inclusion of mitigation examples. The 'Testing' column now reflects the specific type of fishery and location in which the research was conducted, the target species of the fishery. We have also added columns addressing potential impacts of mitigation techniques on target species catch rates and human safety considerations.

3. PROPOSED TOOLBOX

A proposed mitigation advice document is provided as Annex 1. Table 1 of the Annex forms the toolbox table and applies the advice categorisation to a range of mitigation options identified that are or may be applicable to a range of different artisanal and small-scale fishing methods. We have also provided some introductory text on artisanal and small-scale fisheries and how this influences development and application of mitigation in these fisheries. Additional considerations, in particular the further guidance for fisheries managers developed prior to SBWG7, has also been included.

Annex 1: Proposed toolbox template for ACAP mitigation advice for artisanal and small-scale fisheries

ARTISANAL & SMALL-SCALE FISHERIES

While there is no universally agreed upon definition of artisanal and small-scale fisheries (SSF), previous work presented to ACAP have provided some clarity and definition (e.g. Debski et al. 2014, Favero et al. 2014, Goya et al. 2011). Along with a clearer understanding of the characteristic of these fisheries, it has also become evident that seabird bycatch does occur in some SSFs, including the bycatch of ACAP listed species (e.g. Mangel et al. 2012). Some commonly recognized characteristics of SSFs include their:

- Lack of mechanization
- Small vessel and crew size
- Highly geographically dispersed fleets
- Vessels change and adapt gear frequently
- Limited enforcement of existing regulations
- Common in impoverished communities, i.e. few resources for monitoring, mitigation

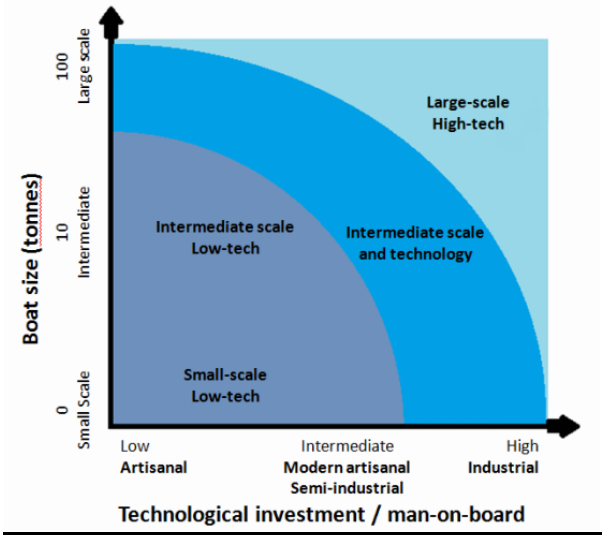

Figure 1. Graphic definition of small-scale, artisanal and industrial fisheries as a function of vessel size and relative technological investment. Adapted from FAO Small-scale and artisanal fisheries at http://www.fao.org/fishery/topic/14753/en.

TOOLBOX CONSIDERATIONS

Given these SSF characteristics, opportunities for bycatch mitigation are, in many cases, challenging to identify or implement. Early efforts to test or implement bycatch mitigation mostly focussed on sea turtles and small cetacean bycatch (e.g. Gilman et al. 2010, Mangel et al. 2013, Peckham et al. 2015, Ortiz et al 2016). More recent mitigation developments relevant to seabird bycatch are summarised in the toolbox table.

Apart from known technical solutions to bycatch, when working with SSF we believe that it is imperative that alternative methods to reduce bycatch be considered. This need for

alternative methods takes into account the challenges in testing and implementing mitigation measures in these fisheries, including the fishery characteristics detailed above. This toolbox approach of mitigation solutions in SSF therefore includes the implementation of educational/outreach campaigns, the development of human resources (capacity building), long-term working plans in SSF communities, training in safe handling and release, and co-management of resources or fishing grounds, among others. Tools like these can be considered to be potentially applicable across fishery types. These non-technological solutions may often be the first or perhaps most effective options available in these fisheries. The dynamic nature of SSF also reinforces the need for fishery monitoring, as this can help identify emergent bycatch issues or potential opportunities to guide fishery development to reduce negative impacts before practices become entrenched.

In choosing a mitigation solution, apart from the summary information contained in the toolbox table, we have developed a series of guidance questions that can help researchers and managers determine if a particular mitigation technology is feasible for their SSF:

- What oversight or enforcement is required to demonstrate implementation
    - Mitigation fixed into fishing gear can more easily be monitored (e.g. port inspection).
- The estimated financial cost of the mitigation solution and how that compares to the operating costs in the fishery.
- Whether the equipment require maintenance or replacement parts.
    - Who would provide maintenance and replacements?
    - Are components available in local markets or do they need to be imported?
    - What are the ongoing costs?
- Whether training in the mitigation technique is required.
    - Who would provide the training?
    - Is there sufficient training capacity?
- Whether the mitigation technique is appropriated for a small vessel.
    - Consider storage space, effective deployment, etc.
- Whether the mitigation technique impacts the target catch or leads to changes in bycatch (including other bycatch species).

Table 1. Mitigation toolbox.

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.	

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 & 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

Purse-seine

Mitigation	Function	Testing	Findings	Target catch	Human safety considerations	Additional benefits	Limitations / considerations	Source	Status

Legend (proposed categorisation of status in terms of mitigation efficacy):

	Reduced bycatch of ACAP species
	Reduced seabird bycatch, not proven for ACAP species
	No reduction in seabird bycatch, but reduced other bycatch fauna (e.g. marine turtles, small cetaceans)
	Testing in progress or tested in non SSF fisheries
	No reduction in bycatch

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