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**Developing methods to review the effectiveness of
seabird bycatch mitigation regulations in tuna RFMOs**

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 <p data-bbox="215 521 446 560">Agreement on the Conservation of Albatrosses and Petrels</p>	<p data-bbox="501 241 1401 280">Fifth Meeting of the Seabird Bycatch Working Group</p> <p data-bbox="858 297 1401 336"><i>La Rochelle, France, 1-3 May 2013</i></p> <p data-bbox="533 414 1356 560">Developing methods to review the effectiveness of seabird bycatch mitigation regulations in tuna RFMOs</p> <p data-bbox="673 649 1220 687"><i>Cleo Small, BirdLife International</i></p>
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SUMMARY

The five tuna commissions have established requirements for their pelagic longline vessels to use seabird bycatch mitigation measures in most areas overlapping with albatrosses. In ICCAT and IOTC there are stated intentions to review the effectiveness of these methods in 2015 and 2016, respectively, and there are commitments to regular review in WCPFC, IATTC and CCSBT. However, methodologies or criteria for review have not yet been defined. This paper invites SBWG views on potential appropriate methods or minimum elements, and highlights the advantages that would result from harmonizing monitoring methods across the tuna RFMOs, in order that cumulative impacts on albatrosses can be monitored.

RECOMMENDATIONS

The paper invites the SBWG to consider:

1. Are there minimum elements that should be included in tuna RFMO reviews of seabird bycatch mitigation measures?
2. Whether it would be valuable to encourage harmonisation of review methods across tuna RFMOs, in addition to harmonisation of data collection and data reporting?

Desarrollo de métodos para evaluar la efectividad de reglamentaciones para mitigar la captura secundaria de aves marinas en OROP de atún

Las cinco comisiones de atún han establecido los requisitos para que sus buques de pesca con palangre pelágico usen medidas de mitigación de la captura secundaria de aves marinas en la mayoría de las áreas que se superponen con albatros. En la ICCAT y la IOTC hay intenciones manifiestas de evaluar la efectividad de estos métodos en 2015 y 2016, respectivamente, y existen compromisos para realizar evaluaciones periódicas en la

WCPFC, la IATTC y la CCSBT. Sin embargo, aún no se han definido las metodologías ni los criterios para la evaluación. Este documento presenta las opiniones del GdTCS sobre los posibles métodos adecuados o elementos mínimos, y destaca las ventajas que se obtendrían al armonizar los métodos de monitoreo entre todas las OROP de atún, para que puedan monitorearse los efectos acumulativos en los albatros.

RECOMENDACIONES

El documento invita al GdTCS a analizar:

1. ¿Hay elementos mínimos que deben incluirse en las evaluaciones de las OROP de atún de las medidas de mitigación de la captura secundaria de aves marinas?
2. ¿Sería de valor alentar la armonización de los métodos de evaluación entre todas las OROP de atún, además de la armonización de la recolección de datos y el informe de datos?

Elaboration de méthodes visant à analyser l'efficacité de la réglementation des ORGP thonières en matière d'atténuation de la capture accessoire des oiseaux de mer

Les cinq commissions thonières ont établi les critères selon lesquels leurs palangriers pélagiques devront assurer la mise en place de mesures d'atténuation de la capture accessoire d'oiseaux de mer dans la plupart des zones de pêche qui abritent des albatros. La CICTA et la CTOI ont déclaré leur intention d'examiner l'efficacité de ces méthodes d'atténuation en 2015 et 2016 respectivement, et il existe des engagements similaires au sein des autres commissions WCPFC, IATTC and CCSBT. Toutefois la méthodologie ou les critères pour servir à cet examen n'ont pas été définis, du moins jusqu'à l'heure. Le document invite les membres du Groupe de travail GTCA à se prononcer quant aux méthodes les plus appropriées ou quant aux éléments de base de cette méthodologie, et souligne les avantages qui découleraient de l'harmonisation des méthodes de contrôle des ORGP thonières afin d'éviter les impacts cumulatifs sur les albatros.

RECOMMANDATION

Le Groupe de Travail GTCA est invité à considérer les questions suivantes :

1. Existe-il des éléments de base dans les mesures d'atténuation des captures accessoires d'oiseaux de mer, qui devraient être inclus dans toute procédure de révision des ORGP thonières ?
2. Serait-il approprié d'encourager l'harmonisation des méthodes d'analyse des ORGP thonières sur l'efficacité de leurs mesures d'atténuation de la capture accessoire des oiseaux de mer, ceci en plus de l'harmonisation de la collecte de données et de la déclaration de ces données ?

1. TUNA RFMO PLANS TO REVIEW THE EFFECTIVENESS OF THEIR SEABIRD BYCATCH MEASURES

To date, the tuna commissions have established seabird bycatch mitigation requirements for longline vessels in areas overlapping with albatrosses (though with some variation in mitigation measures required, and with a few remaining geographic gaps). In addition, all tuna RFMO seabird bycatch measures have provisions for review of the effectiveness of these measures. In ICCAT and IOTC there are specific commitments to reviews in 2015 and 2016, whereas in the others there are commitments to regular review, but with unspecified time frames (Annex 1).

However, it has not yet been established what methods or criteria these reviews would be based on, and it could be useful for ACAP or ACAP member countries to provide guidance on this. Indeed, the ICCAT Sub-Committee on Ecosystems had on its July 2012 meeting agenda the following objective '*Define the strategy to evaluate the efficacy of the seabird bycatch mitigation measures defined under Rec. [11-09]*', but a lack of proposed methodology meant that this agenda item was not addressed.

In addition, given that most albatross species migrate between the areas of more than one tuna RFMO, benefits would be derived from having a harmonized system between the tuna RFMOs in terms of monitoring overall seabird bycatch, in order that cumulative impacts on each species might be assessed.

2. DATA COLLECTED AND REPORTED BY TUNA RFMO LONGLINE VESSELS

Methods to monitor and review the effectiveness of tuna RFMO seabird measures will be guided in part by the availability of data.

In terms of data collection, tuna RFMOs have established requirements for their longline fleets to have at least 5% observer coverage, with CCSBT having a recommendation of 10% observer coverage since 2001. CCSBT, IOTC and WCPFC have elaborated data collection requirements, and these are under development at IATTC. ICCAT has not yet established minimum standards for its observer programs, although there have been ongoing attempts to establish these (a more detailed comparison of tuna RFMO data collection methods in, for example, SBWG5 Doc 26, Anderson and Small 2012, Wolfaardt 2011). In addition, ICCAT has offered to lead efforts among the tuna RFMOs to harmonized minimum data collection requirements for longline observer programs (ICCAT 2012).

In terms of data reporting, WCPFC requires member states to submit raw observer data to the WCPFC Secretariat (WCPFC CMM 07-01), and IOTC also has agreed detailed reporting protocols, which include spatial (5x5°) and temporal stratification of observer data (IOTC Resolution 11-04). In 2012, CCSBT refined its reporting requirements for national reports submitted to the Ecologically Related Species Working Group (CCSBT 2012). However, ICCAT and IATTC have not yet developed their reporting requirements, although these are under discussion. The CCSBT ERSWG and the ICCAT Sub-Committee on Ecosystems have noted that it would be highly beneficial for reporting requirements to be harmonized across the tuna commissions in order to be able to assess cumulative impacts on non-target species (CCSBT 2012, ICCAT 2012).

In addition, other pertinent data would include monitoring and compliance data on use of bycatch mitigation measures by vessels. However, methods to monitor compliance with

bycatch mitigation measures have not yet been substantially discussed within tuna RFMOs compliance committees.

3. METHODS FOR REVIEW

There are a range of methods that might be used to ‘review effectiveness’ of the tuna RFMO seabird bycatch mitigation measures, ranging from simple to more complex.

A decision on the most appropriate method will be guided by factors such as review objectives, data availability, and available capacity and resources to undertake the review.

Examples of possible review methods, and where they have been used to date, are shown in Table 1. In addition, it may be that the methods agreed for an ACAP bycatch indicator (SBWG5 Agenda item 8) would have application to the tuna RFMO context. Methods established to monitor the effectiveness of National Plans of Action may also be appropriate.

Table 1. Examples of methods that could be used to ‘review effectiveness’ of existing tuna RFMO seabird bycatch mitigation measures

Method	Description	Examples of use
Compare requirements to ‘best practice’	At its simplest, tuna RFMO seabird bycatch mitigation requirements could be compared to what is considered international best practice for pelagic longlines (e.g. compared to ACAP best practice advice). This has a great advantage of simplicity, but does not assess extent of vessel compliance with bycatch mitigation requirements and does not monitor the number of birds killed	Has been used to date to build the case for strengthening tuna RFMO seabird bycatch mitigation requirements
Track reported seabird bycatch rates	Tuna RFMOs could monitor reported seabird bycatch rates (birds caught/1000 hooks) over time, with expectations that rates would decrease as mitigation measures are implemented, and with the potential to make comparisons between different fleets. However, this approach would need to be able to account for non-reporting fleets, as well as account for bias that may occur from data reported from low or non-representative observer coverage. In addition, given that bycatch rates vary spatially and temporally, it may be that the bycatch rate needs to be standardised to take into account variations in fishing effort distribution. However, currently, ICCAT and	Widespread use

	<p>IATTC do not require fleets to report their raw or spatially and temporally stratified observer data to RFMO Secretariats, so standardisation would not be feasible. IOTC and WCPFC do have requirements to submit stratified observer data, but very few data have been submitted to date. An additional factor that would need to be accounted for is that impact on seabirds could increase if fishing effort goes up, even if bycatch rates go down. In some cases decreases in bycatch rates could reflect declining populations, although this will be a problem for a number of these methods.</p>	
<p>Estimate number of birds killed per year</p>	<p>Use best available seabird bycatch rate data together with estimates of fishing effort in order to estimate the number of birds killed per year. Spatial and temporal stratification can be used (e.g. best available bycatch rate for each 5x5 degree square and year quarter, multiplied by fishing effort). Bycatch rates may be estimated for non-reporting fleets using the nearest bycatch rate estimate. Estimates of the number of each species killed could be made if reliable species level data were available.</p> <p>The 2012 meeting of the CCSBT Ecologically Related Species Working Group recommended that data be reported in such a stratified way that CCSBT could estimate total seabird mortality, and that such reporting be harmonized with other tuna RFMOs as far as possible (paras 32 and 56, CCSBT 2012).</p>	<p>Klaer 2009</p>
<p>Risk assessment</p>	<p>Estimate and monitor bycatch risk using data on seabird distribution and fishing effort combined with a measure of a species' vulnerability to bycatch, where <i>vulnerability</i> is derived from a detailed observer data set in which bycatch rates by species are compared to estimated species distribution. An estimate of number of birds caught can be created by weighting seabird distribution by population size, and this can be compared to estimates of Potential Biological Removal, if demographic parameters are available.</p>	<p>Waugh et al 2012 Richard and Abraham 2013 Richard et al. 2013</p>

	<i>Vulnerability</i> will be affected by the degree of implementation of seabird bycatch mitigation measures, therefore to track the effectiveness of tuna RFMO seabird measures, the <i>vulnerability</i> measure (or at least degree of bycatch mitigation measure implementation) would need to be tracked for each fleet. Given the data requirements for this type of analysis, this may not be a feasible monitoring tool at the RFMO level.	
Population modelling	For those species for which sufficient demographic and population data are available, population models can be constructed which model impact of tuna pelagic longline fisheries at a colony or population level. However, given levels of background noise in such analyses, and impacts of non-tuna fleets, it may not be possible to use this to monitor impacts of seabird bycatch mitigation measures in the tuna pelagic longline fleets.	Tuck <i>et al.</i> 2001 Tuck <i>et al.</i> 2011
Population status	Monitor the population trends and responses of relevant albatross and petrel colonies. However, colonies will be impacted factors other than tuna pelagic longline fleets.	
Compliance monitoring	Monitor the number of longline vessels that are using seabird bycatch mitigation measures, in port or at-sea. What systems are available for collecting such compliance data?	

4. CONCLUSION

Given that all five tuna RFMOs have now established seabird bycatch mitigation requirements, it is a useful time to consider how the effectiveness of these measures might best be monitored, or at least to identify minimum essential elements that reviews should include, to consider data collection and reporting that would be needed in order to facilitate this analysis.

A range of methods are available to 'review the effectiveness' of seabird bycatch mitigation regulations. Some are data intensive, and only available to data-rich fisheries or certain species or colonies (e.g. population modelling). It could be that an effective approach would use a simple method for a wide range of species, combined with a data intensive approach for a limited number of species.

If review methods were harmonized across the tuna RFMOs, this could facilitate seabird bycatch comparisons between tuna RFMOs. It could provide a useful gap analysis in terms of low levels of observer coverage and/or data accessibility. For those albatross species that are distributed across multiple tuna RFMO areas, this could be important in order to assess cumulative impacts on these species. ACAP and ACAP member countries could provide useful guidance to tuna RFMOs on this issue.

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ANNEX 1

Paragraphs with the tuna RFMO seabird conservation and management measures that outline plans to review the effectiveness of these measures

<p>ICCAT Recommendation 11-09</p>	<p>Paragraph 8. In 2015, the SCRS shall conduct another fishery impact assessment to evaluate the efficacy of these mitigation measures. Based on this fishery impact assessment, the SCRS shall make appropriate recommendations, if necessary, to the Commission on any modifications.</p>
<p>IOTC Resolution 12-06</p>	<p>Paragraph 6. The Scientific Committee, based notably on the work of the WPEB and information from CPCs, will analyse the impact of this Resolution on seabird bycatch no later than for the 2016 meeting of the Commission. It shall advise the Commission on any modifications that are required, based on experience to date of the operation of the Resolution and/or further international studies, research or advice on best practice on the issue, in order to make the Resolution more effective.</p>
<p>WCPFC CMM 12-07</p>	<p>Paragraph 6. The SC and TCC will annually review any new information on new or existing mitigation measures or on seabird interactions from observer or other monitoring programmes. Where necessary, an updated suite of mitigation measures, specifications for mitigation measures, or recommendations for areas of application will then be provided to the Commission for its consideration and review as appropriate.</p> <p>Paragraph 8: The intersessional working group for the regional observer programme (IWG-ROP) will take into account the need to obtain detailed information on seabird interactions to allow analysis of the effects of fisheries on seabirds and evaluation of the effectiveness of bycatch mitigation measures.</p>
<p>CCSBT ERS Recommendation 2011</p>	<p>Paragraph 6: The Extended Commission will review the operation of this Recommendation with a view to enhancing the protection of ecologically related species from the impacts of fishing for southern bluefin tuna.</p>
<p>IATTC Resolution C-11- 08</p>	<p>Paragraph 11: The effectiveness of this resolution to reduce seabird bycatch in the EPO, including the mitigation measures in Table 1, the area of application, and the minimum technical specifications adopted pursuant to this resolution, shall be subject to review and possible modification, taking into account the scientific advice from the Working Group on Bycatch, the SAC, and the IATTC scientific staff.</p>