Agreement on the Conservation of Albatrosses and Petrels

Eighth Meeting of the Seabird Bycatch Working Group

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Report of the workshop: Collaborative work to assess seabird bycatch in pelagic longline fleets (South Atlantic and Indian Oceans). 20 to 23 of June 2017, Montevideo, Uruguay

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SUMMARY

A collaborative work to assess seabird bycatch in the pelagic longline fleets operating in the South Atlantic (SAO) and Indian (IO) Oceans from an entirely scientific perspective, was conceived by researchers from several national fleets during the Inter-sessional Meeting of the Sub-committee on Ecosystems of ICCAT, in September 2016. The objectives of this process are 1) to determine the spatio-temporal patterns of seabird bycatch, 2) to estimate the seabird bycatch (at the lowest possible taxonomic level) and data permitting, 3) to gain knowledge on the performance of mitigation measures. A first workshop was celebrated during 20-23 June of 2017 in Montevideo, Uruguay. During this meeting raw observer data from the fleets of Brazil, Japan, Portugal and Uruguay were presented/submitted by scientists of the respective countries. The main objectives of this workshop were to understand the data of each country, to define the levels (i.e. seabirds, groups, species) and scales (spatial and temporal) at which the analyses will be conducted and to discuss alternatives of data analyses. This report summarises the results of the workshop.

Informe del taller: Trabajo colaborativo para evaluar la captura incidental de aves marinas en flotas de palangre pelágico (océanos Atlántico sur e Índico).

20 al 23 de junio 2017, Montevideo, Uruguay

RESUMEN

Durante la Reunión intersesiones del Subcomité de Ecosistemas de ICCAT en septiembre de 2016, investigadores de varias flotas nacionales propusieron la realización de un trabajo en colaboración, desde una perspectiva totalmente científica, para evaluar la captura incidental de aves marinas en las flotas de palangre pelágico que operan en los océanos Atlántico sur e Índico. Los objetivos de este proceso son: 1) determinar los patrones espacio-temporales de la captura incidental de aves marinas, 2) estimar la captura incidental de aves marinas (al nivel taxonómico más bajo posible), y en caso de que los datos lo permitan, 3) obtener conocimiento sobre el desempeño de las medidas de mitigación. Un primer taller se celebró del 20 al 23 de junio de 2017 en Montevideo, Uruguay. Durante esta reunión, los científicos de los respectivos países presentaron / enviaron datos crudos de observadores a bordo de las flotas de Brasil, Japón, Portugal y Uruguay. Los principales objetivos de este taller fueron comprender los datos de cada país, definir los niveles (i.e., aves marinas, grupos, especies) y escalas (espaciales y temporales) más apropiados para los análisis y discutir alternativas de metodologías para el análisis de datos. Este informe resume los resultados del taller.

1. INTRODUCTION

A collaborative work to assess seabird bycatch in the pelagic longline fleets operating in the South Atlantic (SAO) and Indian (IO) Oceans from an entirely scientific perspective, was conceived by researchers from several national fleets during the Inter-sessional Meeting of the Sub-committee on Ecosystems of ICCAT, in September 2016. The objectives of this process are **1) to determine the spatio-temporal patterns of seabird bycatch**, **2) to estimate the seabird bycatch (at the lowest possible taxonomic level)** and data permitting, **3) to gain knowledge on the performance of mitigation measures**. A first workshop was celebrated during 20-23 June of 2017 in Montevideo, Uruguay. During this meeting raw observer data from the fleets of Brazil, Japan, Portugal and Uruguay were presented/submitted by scientists of the respective countries. The main objectives of this workshop were to understand the data of each country, to define the levels (i.e. seabirds, groups, species) and scales (spatial and temporal) at which the analyses will be conducted and to discuss alternatives of data analyses.

This report summarises the results of the workshop.

2. RESULTS

2.1. Understand the data of each country

An overview of the data from each country was presented.

- Uruguayan observer data: observers identify seabird after getting training course, and scientists do the double checking by autopsies and external measurements. The Uruguayan observer data are from the Uruguayan fleet (1998 - 2012) fishing in southwest Atlantic Ocean and the Japanese fleet (2009 - 2011 and 2013) fishing under license in Uruguayan EEZ. The mean annual percentage of observed fishing (hooks) in the Uruguayan fleet was 30%, but varied from 4% in the early years of the programme to 79 %. Japanese fleet had 100% observer coverage. Overall, 86% of the birds in the first fleet are identified at species level, and over 95% from 2005. In the second fleet, more than 98% of the birds were identified into species level.
- Japanese observer data: identification of seabirds was done by scientist by the photo taken by the observer. Japanese observer data has complex species group because the data is across all three Ocean, distributions of many kinds of species overlap with each other and in some area, possible species are multiple when it is identified by photo, site and bill length. Japanese observer data distributed southeastern Atlantic Ocean and Indian Ocean and Tasman Sea from 1997 to 2016. The distribution of all the species group in the Southern Ocean was showed.
- Brazilian data: two data sets are available- data from Projecto Albatroz and data taken by the government, each has observer data and logbook data. There are three fleets: Chartered fleet, Southeast south fleet and Itaipara like; the latter is the largest in number of vessels. The available observer data from Projecto Albatroz were from 2000 to 2012 and seabirds were identified to species level. Therefore, this data set was the main one used from this country in the workshop. Government data of Brazilian data is needed some work to be able to analyse.
- Portugal observer data: seabird bycatch data from the observer program in the western and central Indian Ocean from 2011 to 2016 was submitted by Portugal. Observer data from the Atlantic Ocean could not be prepared for this meeting, but will be submitted shortly.

Overall, temporal and spatial observer coverage of the fishing effort of all the fleet varied between years and season. The bycatch data have many zeros and was very skewed.

2.2. Definition of the levels and scales for analyses

Based on the presented data by the countries, it was recognized that analyses should be firstly prioritised at seabird level. Secondly, it is also important to understand bycatch at level of species; however, it was recognised that in some cases the analyses should be addressed at species group level due to the difficulties to separate some species. In such cases, it was agreed that all the data available at species level for the member of each group should be compiled from the data sets to understand the bycatch pattern. In terms of spatial scale, it was discussed that for **objective 1** is important to work set by set. However, to estimate bycatch

(**objective 2**) it was agreed that analysis should be 5x5 degree. This was because ICCAT and IOTC effort data are mostly aggregated to that level.

2.3. Data required for analyses

The data that should be provided by each country to conduct the analysis were discussed. The following minimum information set by set was found to be important; trip ID; vessel ID; set ID; date; time of the start and the end of the operation; latitude; longitude of the beginning of the setting operation; observed fishing effort in number of the hook; number of bycatch of seabird identified species level as possible. It was also recognised to be important to obtain information of mitigation measures (Presence of Tori line, weighted blanch line) when available to address the **objective 3**. The minimum information presented above was considered important to obtain other relevant factors affecting bycatch, such as time of the set (night – day setting), moon phase, bathymetry etc.

In order to address the **objective 2**, the ICCAT and IOTC fishing effort data are needed.

2.4. Alternatives for the data analysis

Different models were discussed and found to be potential suitable to analyse the data (GLM, GLMM, GAM, GAMM, Random Forest etc.). However, it was also agreed that these analyses will depend on the total integrated data to be collect, including those from other countries that are willing to contribute their own data in the near future. In order to address the **objective 1) and 2)**, it was agreed that analyses should include a number of variables that are described below:

- Based on the current observer data available, it was agreed that the data should be categorised into four regions; south western Atlantic (70W-20W), south eastern Atlantic (20W-20E), western Indian Ocean (20E-80E), and eastern Indian Ocean (80E-150E), These categories were based on the distribution of the main bycatch species and available fishing observer report.
- Based on the spatial and temporal coverage of the fishing effort observed, it was found, year should be grouped in period of multiple year (e.g. 2-5 years).
- From a biological perspective, it was agreed that data should be analysed by two seasons; breeding season and non-breeding season. In order to analyse bycatch at seabird level, these two periods were defined based on the breeding/non-breeding seasons of the main capture species in the available database (Black-browed albatross, Atlantic yellow-nosed albatross, Indian yellow-nosed albatross, grey-headed albatross, White-chinned petrel, **Table 1, Figure 1**). These two periods are October to April (Breeding season) and May to September (Non-breeding season). However, any analyses conducted at species level should include the specific breeding cycle.
- Latitude and bathymetry should be included in both set by set (**objective 1**) and 5x5 degree (**objective 2**) level analyses. For the later analysis, it was discussed that latitude at the mean point of the 5x5 degree cell can be arbitrary used. For bathymetry, two potential scenarios were discussed; mean bathymetry or gradient of bathymetry.

- Only for the analyses at set by set level, it was agreed that trip ID and/or vessel ID (potentially in some models either as fixed or random factors), time of the set (day or night setting) and moon phases should be included. Moon phases should be divided into two or four categories.

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The importance of seeing data gaps and start from simple models were recognised. The distribution of the observed fishing effort already available during the breeding and non-breeding seasons is provided in **Figure 1**. The process of this collaborative work was considered to be of value, so on the course of deciding the method for the analyses, discussions and agreements between each country are needed.

References

ACAP(2012a) http://acap.aq/en/resources/acap-species2/238-black-browed-albatross/file

ACAP (2012b) http://acap.aq/en/resources/acap-species2/248-grey-headed-albatross/file

ACAP(2012c) https://acap.aq/en/resources/acap-species2/295-indian-yellow-nosed-albatross/file

ACAP(2012d) https://acap.aq/en/resources/acap-species2/290-atlantic-yellow-nosed-albatross/file

ACAP (2012e) http://www.acap.aq/en/acap-species/306-white-chinned-petrel/file

Table 1. Seasonal breeding stages of main seabird species incidentally captured in the observed pelagic longline fishing data available (sources: ACAP 2012 a,b,c, d and e).

Month	Black-browed Albatrosses	Grey-headed Albatrosses	Indian Yellow-nosed Albatrosses	Atlantic Yellow-nosed Albatross	White-chinned Petrel
January	Chick Provisioning	Chick Provisioning	Chick Provisioning	Chick Provisioning	Chick Provisioning
February	Chick Provisioning	Chick Provisioning	Chick Provisioning	Chick Provisioning	Chick Provisioning
March	Chick Provisioning	Chick Provisioning	Chick Provisioning	Chick Provisioning	Chick Provisioning
April	Chick Provisioning	Chick Provisioning	Chick Provisioning	Chick Provisioning	Chick Provisioning
May	Non-breeding	Non-breeding	Non-breeding	Non-breeding	Non-breeding
June	Non-breeding	Non-breeding	Non-breeding	Non-breeding	Non-breeding
July	Non-breeding	Non-breeding	Non-breeding	Non-breeding	Non-breeding
August	Non-breeding	Non-breeding	Non-breeding	Non-breeding	Non-breeding
September	Non-breeding	Non-breeding	Egg Laying	Egg Laying	Non-breeding
October	Egg Laying	Egg Laying	Egg Laying	Incubation	Egg Laying
November	Incubation	Incubation	Incubation	Incubation	Incubation
December	Incubation	Chick Provisioning	Incubation	Chick Provisioning	Incubation

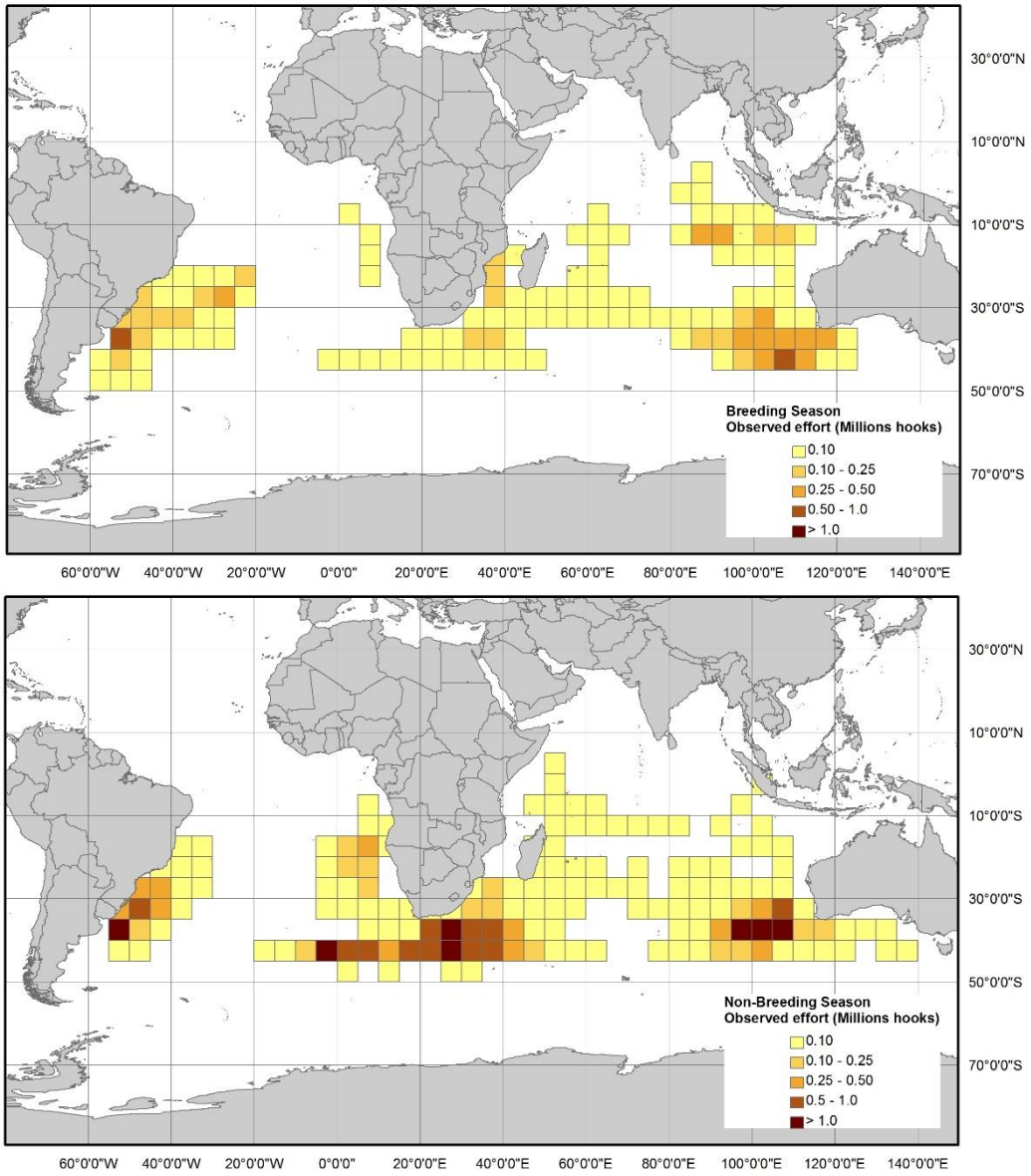

Figure 1. Distribution of the total fishing effort observed in the pelagic longline fleets of Brazil (2000-2012), Japan (1997-2016), Portugal (2011-2016, only Indian Ocean) and Uruguay (1998-2013, including Japanese vessel fishing under license in the Uruguayan EEZ) during the breeding (October-April) and non-breeding (May-September) seasons of the main captured species (see **Table 1**).