Agreement on the Conservation of Albatrosses and Petrels

Fifth Meeting of the Seabird Bycatch Working Group

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Review of bycatch data reporting by Parties

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SUMMARY

The ACAP Action Plan calls on Parties to collect reliable data to allow the accurate estimation of the nature and extent of interactions between ACAP-listed species and fisheries. The Advisory Committee is expected to collate, update and regularly review these data. A phased process has been conducted to develop a bycatch data reporting framework, which has included the development and use of a web-based system for Parties and Range States to report fisheries and bycatch data. This paper outlines the further development of the bycatch data reporting process. The submitted data have yet to be analysed in any detail. However, it is evident that the temporal and spatial resolution of the data currently provided are too coarse to enable useful assessments of bycatch levels and trends, and there is a need to define standards for what is meant by 'reliable' data and 'accurate' assessments. It is recommended fishing effort and seabird bycatch data should be submitted at a spatial scale no broader than 5 degree grid squares, and that these data are reported per month, rather than per quarter or year as is currently the case. Due consideration will need to be taken of capabilities of Parties and Range States to implement such actions, and it is anticipated that the resolution of the reported data and the type of assessments possible will improve in a progressive manner. It is also important to consider whether the objectives of the process should focus specifically on estimation of bycatch and efficacy of mitigation measures (as originally proposed), or should be expanded to consider the impacts of bycatch (and mitigation) on the populations of ACAP species. The latter approach will require the use of ecological risk assessment methods, and the use of other data sets on population trends and distribution.

RECOMMENDATIONS

1. That the Seabird Bycatch Working Group considers and endorses the proposal to improve the resolution of seabird bycatch and associated fisheries data reported by Parties and Range States to ACAP, and work towards a minimum data standard of 5x5 degrees square and monthly.

2. That the Seabird Bycatch Working Group agrees the need to define more explicitly the objectives of the bycatch data reporting process and the standards for data reliability and accuracy of bycatch estimation.
3. That the Seabird Bycatch Working Group supports the need for expert assistance in developing an assessment framework and performance metrics for use by ACAP.
4. That the Seabird Bycatch Working Group considers expanding the objectives of the bycatch reporting and assessment process to include an assessment of the population level impacts and associated risks of bycatch for ACAP species.

Revisión del proceso de presentación de informes de datos de captura secundaria por las Partes

El Plan de Acción del ACAP solicita a las Partes que obtengan datos confiables para permitir estimar con exactitud las características y el grado de las interacciones entre las especies incluidas en la lista del ACAP y las pesquerías. Se espera que el Comité Asesor coteje, actualice y analice periódicamente estos datos. Se ha llevado a cabo un proceso por fases para desarrollar un marco para la presentación de informes de datos sobre la captura secundaria de aves marinas, que incluyó el desarrollo y el uso de un sistema basado en la web para que las Partes y los Estados del Área de distribución informen datos sobre las pesquerías y la captura secundaria. Este documento describe los avances del proceso de presentación de informes de datos sobre la captura secundaria. Aún no se han analizado detalladamente los datos presentados. Sin embargo, es evidente que la resolución temporal y espacial de los datos actualmente proporcionados no están suficientemente pulidos como para permitir evaluar de manera útil los niveles y las tendencias de la captura secundaria, y existe la necesidad de definir normas para definir lo que se entiende por datos 'confiables' y evaluaciones 'exactas'. Se recomienda que los datos del esfuerzo pesquero y la captura secundaria de aves marinas se presenten en una escala espacial, con cuadrados de grilla no mayores de 5 grados, y que estos datos se informen en forma mensual, en lugar de que hacerlo en forma trimestral o anual, como sucede actualmente. Se le deberá dar la debida consideración a la capacidad de las Partes y los Estados del Área de distribución para implementar estas acciones, y se anticipa que la resolución de los datos informados y el tipo de evaluaciones posibles mejorarán gradualmente. Asimismo, es importante determinar si los objetivos del proceso deberían centrarse específicamente en la estimación de la captura secundaria y las medidas de mitigación de eficacia (como se propuso originalmente), o se deberían ampliar para considerar el efecto (y la mitigación) de la captura secundaria en las poblaciones de las especies del ACAP. El último enfoque requerirá el uso de métodos de evaluación del riesgo ecológico, y el uso de otros conjuntos de datos sobre las tendencias y la distribución poblacionales.

RECOMENDACIONES

1. Que el Grupo de Trabajo sobre Captura Secundaria de Aves Marinas analice y avale la propuesta para mejorar la resolución de los datos de la captura secundaria de aves marinas y las pesquerías asociadas informados por las Partes y los Estados del Área de distribución al ACAP, y trabajen en función de una norma de

datos mínima de cuadrados de 5x5 grados y que se informen en forma mensual.

2. Que el Grupo de Trabajo sobre Captura Secundaria de Aves Marinas acepte la necesidad de definir de manera más explícita los objetivos para el proceso de informe de datos sobre captura secundaria y las normas para determinar la confiabilidad y la exactitud de la estimación de los datos sobre captura secundaria.
3. Que el Grupo de Trabajo sobre Captura Secundaria de Aves Marinas apoye la necesidad de contar con la asistencia de expertos para desarrollar un marco de evaluación e indicadores de desempeño para su uso por parte del ACAP.
4. Que el Grupo de Trabajo sobre Captura Secundaria de Aves Marinas analice la posibilidad de ampliar los objetivos para el informe de datos de captura secundaria y el proceso de evaluación para que incluya una evaluación del efecto en el nivel de población y los riesgos asociados de la captura secundaria de especies protegidas por el ACAP.

Passage en revue par les Parties du système de notification de données liées aux captures accidentelles

Le plan d'action de l'ACAP enjoint les Parties à collecter des données fiables afin de pouvoir évaluer de manière précise la nature et la portée des interactions entre les espèces inscrites à l'ACAP et les pêcheries. Le Comité consultatif est appelé à comparer, actualiser et examiner régulièrement ces données. Un processus progressif a été engagé afin de développer un système de notification de données en matière de captures accidentelles. Ce processus comprend la mise en œuvre et l'utilisation d'un système électronique permettant aux Parties et aux Etats membres de l'aire de répartition de soumettre des données liées aux pêcheries et aux captures accidentelles. Ce document met en lumière le développement ultérieur du processus de notification de données en matière de captures accidentelles. Les données collectées doivent encore être analysées en détail. Cependant, il est évident que les données collectées jusqu'à présent ne sont pas suffisantes pour pouvoir évaluer correctement le niveau de captures accidentelles et les tendances en la matière. Il convient d'instaurer des normes pour comprendre ce que recouvrent les termes « données fiables » et « évaluations précises ». Il est recommandé que les données en matière d'effort de pêche et de captures accidentelles d'oiseaux marins n'excèdent pas des cases de 5 degrés, et que ces données soient présentées mensuellement, et non pas trimestriellement ou annuellement, comme c'est le cas actuellement. Il faudra tenir compte de la capacité des Parties et des Etats membres de l'aire de répartition à mettre en œuvre ces actions. Il est prévu que la qualité des données et des évaluations s'améliore. Il est également important de savoir si les objectifs du processus doivent privilégier l'estimation des captures accidentelles et de l'efficacité des mesures d'atténuation (comme proposé initialement), ou s'ils doivent tenir compte de l'impact des captures accidentelles (et des mesures d'atténuation) sur les espèces inscrites à l'ACAP. Cette dernière approche impliquera l'utilisation de méthodes d'évaluation des risques écologiques ainsi que d'autres ensembles de données portant sur les tendances démographiques et la répartition.

RECOMMENDATIONS

1. Il est recommandé que le GTCA examine et avalise les propositions visant à améliorer la qualité des données en matière de captures accidentelles et de pêcheries concernées fournies par les Parties et les Etats membres de l'aire de répartition de l'ACAP, et favorise la collecte mensuelle de données dans une case de 5x5 degrés.
2. Que le GTCA convienne de la nécessité de définir plus clairement les objectifs du processus de notification de données en matière de captures accidentelles de même que les normes liées à la fiabilité et à la précision des estimations en matière de captures accidentelles.
3. Que le GTCA reconnaisse que la contribution d'experts est essentielle au développement d'un cadre d'évaluation et de paramètres de rendement destinés à l'ACAP.
4. Que le GTCA envisage d'élargir les objectifs du processus de notification et d'évaluation des captures accidentelles afin d'y inclure une évaluation de l'impact sur les populations et des risques inhérents aux captures accidentelles pour les espèces inscrites à l'ACAP.

1. BACKGROUND

The ACAP Action Plan states that Parties shall, through the use of at-sea observers on fishing vessels or other appropriate methods, collect reliable and, where possible, verifiable data to enable the accurate estimation of the nature and extent of albatross and petrel interactions with fisheries (Action 4.2). The Action Plan also calls for the Advisory Committee to collate and regularly review and update data on mortality of albatrosses and petrels in commercial and other relevant fisheries (Action 5.1(f)) as well as data on the distribution and seasonality of fishing effort in fisheries that affect albatrosses and petrels (Action 5.1(g)). These are ambitious objectives that have (a) management implications with (b) a statistical basis. The Action Plan does not define what is meant by 'reliable' data and 'accurate estimation' of bycatch. In order to progress the bycatch estimation objectives of the Action Plan, it is important that standards for data reliability and accuracy of estimation are clearly defined, and that subsequent associated management responses are also formally considered (e.g. the management implications if the data are deemed unreliable and estimates are inaccurate).

Following agreement at the second session of the Meeting of Parties (MoP2) that the outputs of the Working Groups of the Advisory Committee should be used to develop, refine and monitor a suite of indicators to measure the success of the Agreement (Resolution 2.8), a process was initiated to develop a system for Parties and Range States to routinely report seabird bycatch and associated fisheries data to the ACAP Secretariat. This process was conducted in a phased manner. Initially, the objectives and scope of the bycatch data reporting process were discussed and defined, draft data reporting templates were developed, and a metadata questionnaire was undertaken to solicit information from Parties.

The latter was used to identify how Parties and Range States assess and monitor seabird bycatch in their fisheries, and the type of data that are currently collected and available for submission to ACAP. Two Parties, Australia and Chile, agreed to test the prototype bycatch data reporting form as part of a pilot exercise (see MoP3 Inf 1 and AC 5 Inf 10).

The outcomes of these processes, and of discussions at AC5, informed the development by the ACAP Secretariat of a web-based reporting system for the provision of seabird bycatch and fisheries data by Parties. Parties and Range States were requested to complete the forms as part of their online reporting (see AC6 Doc 16, and SBWG-4 Doc 25). Overall, the system performed well during the first round of reporting. In total, 10 Parties and two Range States provided data for 79 different fisheries. A number of functionality and content issues were identified by users, which were presented and discussed at SBWG-4 (SBWG-4 Doc 25). These included issues such as the volume of information provided in some of the inputs, and the amount of time available to complete the submission. The SBWG recommended that the reporting format should remain largely unmodified for the time being, but that forms should be available independently of the Advisory Committee's reporting framework (see SBWG-4 and AC6 Final Reports). This will allow data to be submitted on an ongoing basis (i.e. throughout the year), with a deadline for submission (prior to an Advisory Committee meeting) clearly defined, as is the case for breeding site and population data. This recommendation has been endorsed by the Advisory Committee and implemented by the ACAP Secretariat.

The analysis and presentation of the submitted data was discussed at SBWG-4, as well as some of the difficulties and merits of centralising and managing these data in the ACAP database. At SBWG-4, it was agreed that a simple summary of the seabird bycatch and fisheries data should be presented to the fourth session of the Meeting of Parties (see MoP4 Inf Doc 4, Annexes 4 and 5). The SBWG also suggested that the data be investigated intersessionally to determine what analyses could be undertaken, and provide recommendations on the best possible analytical approaches. It was agreed that the investigation should consider the extent to which the original objectives of the bycatch data collection and reporting process, as outlined in MOP3 Inf Doc 1 and AC5 Inf Doc 10), are able to be fulfilled by the data that are currently requested, and to provide feedback to the SBWG on any changes that may be necessary.

2. PROGRESS SINCE AC6 AND RECOMMENDATIONS ON FURTHER ACTIONS REQUIRED

2.1. Submission and presentation of data

Annexes 1 and 2 provide a summary of the most recent fishing effort and seabird bycatch data submitted by Parties and Range States as part of the online implementation reporting process. Nine Parties and one Range State provided or updated data since 2011. There are now 81 fisheries entered in the database; however the level of information provided varies between Parties and fisheries, with key sections of the forms not completed in some cases. Figures 1 to 3 provide a summary of the number of fisheries where fishing effort, observer effort and bycatch data have been entered. As expected, data at the annual level of resolution is more prevalent than quarterly figures.

It should be noted however that other information, not presented here is also collected. This includes fleet size, general information on fishing areas, information on observer programmes, and on mitigation measures required or employed each year. The forms have a number of descriptive text fields and user defined lists, and allow more than one type of data to be entered for some sections. Although these features allow greater flexibility in the data that is able to be submitted, they also make querying the information more complex, and are currently underutilised in any summary information presented.

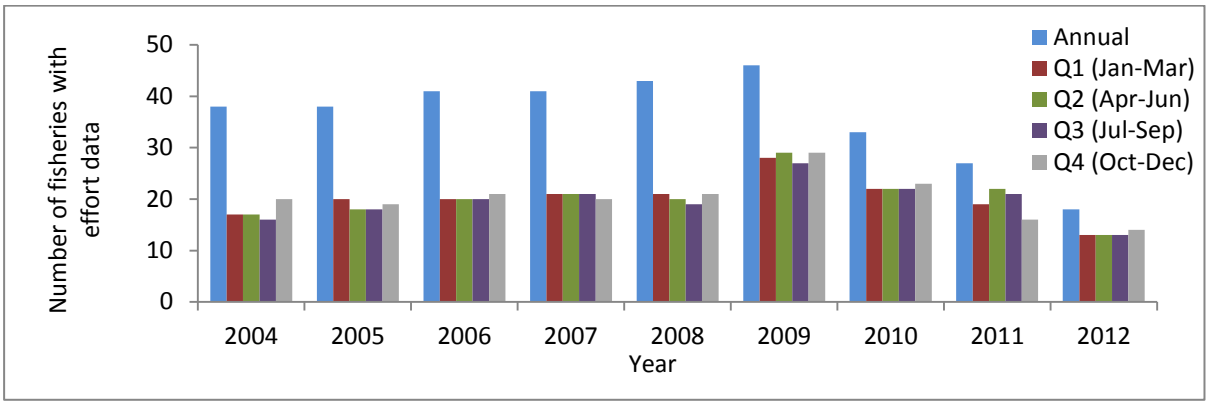

Figure 1. Number of fisheries where annual and quarterly data on **fishing effort** has been entered for each reporting year. Total number of fisheries = 81.

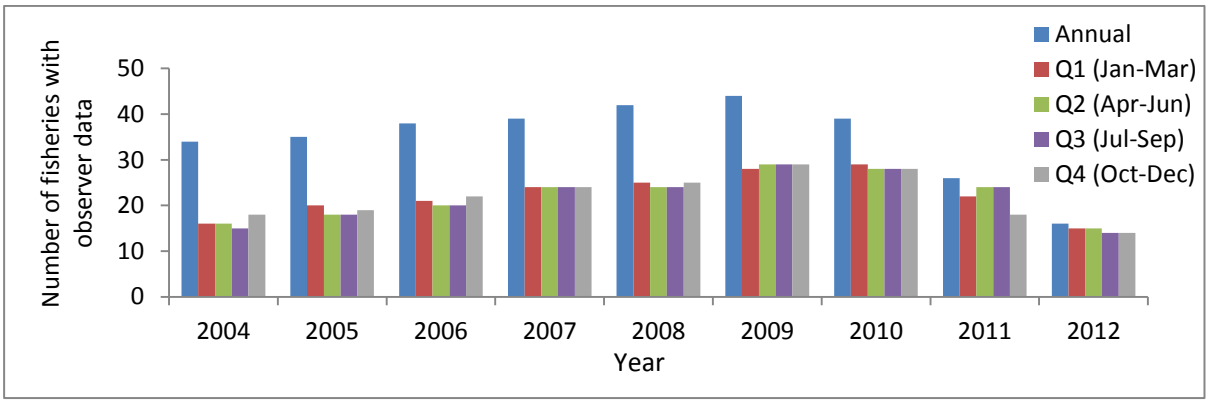

Figure 2. Number of fisheries where annual and quarterly **observed fishing effort** data has been entered for each reporting year. Total number of fisheries = 81.

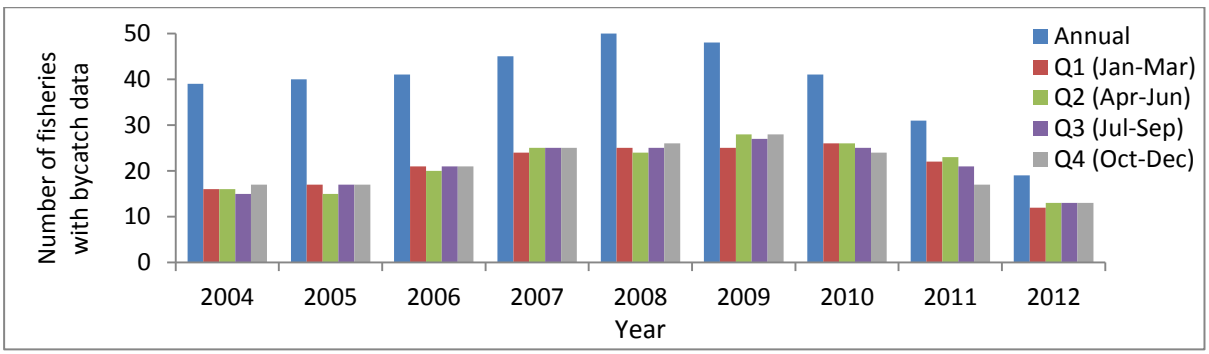

Figure 3. Number of fisheries where annual and quarterly **bycatch** data has been entered for each reporting year. (Including where annual bycatch was reported as 0 and therefore where quarterly fields could have been left blank and do not indicate lack of quarterly data). Total fisheries = 81.

The tables in Annexes 1 and 2 provide a very simple characterisation of the domestic fisheries for which data have been provided and their associated seabird bycatch. Simply presenting a summary of the submitted data is not in itself adequate to achieve the objectives of the bycatch data reporting process, which is: ***to monitor levels and trends of incidental mortality of ACAP-listed species in relevant fisheries and to assess the implementation and effectiveness of bycatch mitigation measures in those fisheries***. It is also important to consider whether the objectives of the process should focus specifically on estimation of bycatch and efficacy of mitigation measures (as stated above), or should be expanded to consider the impacts of bycatch (and mitigation) on the populations of ACAP species. The latter approach includes seabird bycatch levels and rates as a component, and is increasingly being progressed using an Ecological Risk Assessment (ERA) framework (Small *et al*. 2012). Estimating the (seabird) population-level consequences of bycatch is more useful in a management context than simply assessing bycatch rates as it provides more detailed information on vulnerable populations and data gaps that help inform priority management needs. It is acknowledged that an ERA approach is broader in scope than the original objectives of the bycatch data reporting process. However, given the benefits of this approach, the developments in this methodology, and the availability of other relevant data sets, it is recommended that consideration be given to working towards a risk assessment framework that includes population level impacts of bycatch.

Analysis of the data, preferably within a risk assessment framework, is necessary to meet these objectives. Such an assessment requires data on seabird bycatch and fisheries information (e.g. fishing effort, gear type, mitigation measures used), but also on seabird foraging distribution, and population and demographic parameters. The focus of this paper is on the seabird bycatch and fisheries components, but it is useful to consider these within a framework of an ERA, in which the other components are integrated.

Based on intersessional discussions between members of the ACAP Secretariat, the SBWG and other experts, it is clear that accurately assessing rates of seabird bycatch require more detailed (finer-scale) data than are currently requested from, and provided by, Parties and Range States.

2.2. Data and assessment requirements to monitor seabird bycatch, the effectiveness of mitigation measures, and fisheries impacts on ACAP species

The quality and quantity of data available for assessments of fishery impacts on seabirds influences the type of analyses and studies that can be conducted and the consequent reliability of assessment outputs, such as estimates of population level impacts of fishing. Each of the data components required for an ecological risk assessment can be collected (or estimated) at different spatio-temporal scales, from fine-scale (shot-by-shot/set-by-set fishing data) to coarse scale (5 degrees monthly) or very broad fishery-wide scales (seasonal/annual or unknown fishing effort). Currently, the data submitted by ACAP Parties and Range States falls mostly within the third, very broad-scale, category, which limits the type of analyses that can be undertaken. It is acknowledged that as information requirements increase, the costs associated with collecting and maintaining these data also increases. However, the conservation or management cost is that an assessment that is only able to

use very broad-scale data will have much lower levels of precision and therefore reduced reliability in a management context. This reduction in precision (or robustness of outputs) has the potential to undermine discussions at a management level, and lead to unsatisfactory outcomes.

As an example, with data provided on a fishery-wide scale, as is currently the case for the ACAP bycatch data reporting system, increases or decreases in fishing effort and/or inter- or intra-annual shifts in the distribution of fishing effort cannot currently be equated to increases or decreases in risk to ACAP-listed species. Some fisheries cover extensive areas, only a portion of which may overlap with high-risk ACAP species. Consequently, a shift in the extent and/or location of effort into areas not frequented by ACAP species, will likely not impact these species. However, in the current reporting approach, such changes would still be reflected as an overall change in effort and potential risk to ACAP species. This example highlights the need for data to be submitted at a finer spatial and temporal scale than at present, and also highlights the importance of integrating other data sets (e.g. seabird distribution) within a risk assessment framework.

Table 1 outlines a tiered approach to the assessment of fisheries impacts on seabirds. The tier levels relate to the quantity and quality of data available and used in different types of assessment (Smith *et al.* 2008). Tier 1 assessments are data rich and highly quantitative. As one moves to lower Tiers, the quality and quantity of the data decline, with a consequent reduction in the precision of any estimates that come from the associated methods of assessment. The methods in the lower levels (i.e. Levels 3 & 4) can be used in the upper levels, but the methods in the upper levels cannot be used effectively with data from the lower level approaches. The fisheries and bycatch data that are currently provided by Parties fits into Tiers 3 and 4. This does not necessarily mean that the Tier 3 assessment approaches listed in Table 1 can be used with the data currently available to the ACAP Secretariat, especially if these dataset are not complete or of sufficient quality. Consequently, in order to fulfil the objectives of the bycatch data reporting process, and to enable robust assessments of fisheries impacts on ACAP species to be conducted, there is a need to increase the temporal and spatial resolution of data provided by Parties and Range States.

Inevitably, it will be necessary to strike a pragmatic balance between a simple assessment approach with course resolution data and a highly sophisticated and quantitative approach. With low quality input data, an overly simple approach will lack accuracy and precision whereas an overly complex one will be hampered by data gaps and invalid assumptions (but certainly no more invalid than a data-poor assessment), and therefore provide a false representation of the level of accuracy (Small *et al*. 2013). More complex models, with higher quality and quantity of data, allow more refined biological assumptions, so are more realistic than data poor models. An overly complex approach will also be much more costly and onerous to implement. However, the cost implications relate more to the collection of data than to the assessment procedure. Given the number of fisheries and ACAP seabird populations that may need to be reviewed on a regular basis, a pragmatic approach is required. It is also acknowledged that Parties and Range States (and Regional Fisheries Management Organisations, RFMOs) will likely vary in their capacity to submit data at a finer-scale spatial and temporal resolution. Whatever data management and assessment

framework is developed will need to be sufficiently flexible to accommodate data provided at different scales, at least initially.

Table 1. The data available and potential methods (with examples in the literature) for assessing fisheries impacts on seabirds. The quality and quantity of data, and certainty, increases progressively from Level 4 to Level 1.

TIER LEVEL	INFORMATION			
	BIRD	FISHERY	ASSESSMENT	REFERENCES
1	Regular census and monitoring. Biological and distribution studies exist. Observer data (Shot by shot).	Shot by shot, fine-scale data	a) Bird population impact studies. b) Mitigation effectiveness studies	a) Tuck *et al.* (2011), Tuck and Wilcox (2010). b) Klaer and Polacheck (1995; 1997; 1998), Brothers *et al.* (1999), Lewison and Crowder (2003), Duckworth (1995)
2	Snapshot census and monitoring. Coarse-scale distribution data (5x5 degrees, Monthly). Observer data (5x5 degrees, Monthly)	Coarse scale effort data (5x5 degrees, Monthly)	a) Some population modeling. Population trend analyses. b) Bycatch trend analyses	a) Tuck *et al.* (2001), Weimerskirch *et al.* (1997) b) Klaer (2013)
3	Basic biology. Broad bird distribution (limited spatial and temporal resolution) Totals of observer data (annual bycatch and observer effort)	Fishery-wide totals of effort (annual totals, broad spatial footprint)	a) Risk assessment approaches (e.g. PSA[1]). b) PBR[2]	a) Hobday *et al*. (2011), Tuck *et al.* (2011), Small *et al.* (2013), Jimenez *et al.* (2012), Waugh *et al*. (2012). b) Wade (1998), Dillingham and Fletcher (2011)
4	No abundance data. Broad bird distribution. No observer data	Fishery-wide effort footprint. No knowledge of magnitude of effort.	Very basic risk assessment (e.g. PSA[1]) ERA SAFE Methods[3].	Hobday *et al*. (2011), Zhou and Griffiths (2008)

1. PSA – Productivity and Susceptibility Analysis, 2. PBR – Potential Biological Removal, 3. ERA SAFE – Sustainability Assessment for Fishing Effects

2.3. Key recommendations for progressing bycatch data reporting process

Acknowledging the limitations associated with the data currently reported by Parties and Range States, it is recommended that bycatch and fishing data (effort, and associated variables) are reported to ACAP in at least the following spatial and temporal resolution: ***per 5 degree grid squares, and per month (Level 2 in Table 1).*** This is the scale at which most RFMOs calculate and monitor fishing effort and associated fisheries data (although most have yet to formalise the acquisition of seabird bycatch data at this scale), and is considered to be the broadest acceptable scale for such analyses. Clearly, Parties and Range States that are collecting data at a finer scale than this should continue to do so. The finer the resolution of the data collected, the more analytical and assessment options are available. If there is agreement that the seabird bycatch and fisheries data should be provided at the spatio-temporal scale specified above, it is recommended that the SBWG and ACAP Secretariat, in consultation with experts, update the online reporting templates to ensure the data are reported in a manner that facilitates subsequent analyses and assessments. It is likely that some Parties and Range States will be able to provide data at a finer scale than recommended here, whereas others may not be able to meet the recommended resolution standards. Although all Parties and Range States should be encouraged to meet the minimum data standards, this may not be immediately possible in all cases, and it will be necessary to ensure that the reporting format and assessment framework can accommodate data that are coarser than the recommended minimum standards. It is proposed that clear guidelines, and some examples, are provided to assist Parties and Range States in the process. For data that have already been collected, reporting the data at this (finer) resolution (if possible) will enable more robust and meaningful assessments to be conducted. This obviously does not solve the problem of data gaps, but an analysis of the finer-scale data will help identify the data gaps more explicitly, and inform priority actions needed to fill these gaps.

It is anticipated that a progressive change in the quality of the data reported will influence the type of analyses and assessments that can be undertaken. It is recommended that specialist expertise is secured to help develop an analytical and assessment framework that can be used by the ACAP Secretariat to conduct routine (annual) assessments of the impacts of fisheries on ACAP-listed species. This framework should accommodate a progressive improvement in the resolution of data provided, and include a series of data-based performance metrics that could form the basis of the annual reviews. If the outputs of the review were to show that some level of threshold was exceeded, this would serve as a trigger for further management action. This may simply be a more detailed examination of the data (for entry errors, or an explanation of the underlying reason for the threshold being exceeded), or more detailed analyses and assessment if the data show consistent indications of conservation concern. Data-based performance metrics provide a useful tool to track performance of fisheries with respect to seabird bycatch (and mitigation), but they will most likely use data at a relatively broad scale and will not provide an indication of impacts at a population level. Consequently, even if the performance metrics do not show indications of conservation concern, more detailed assessments should be conducted at regular intervals, possibly on a rotational or priority basis. The more detailed assessments could, for example, be conducted once every three years, to facilitate reporting of these results to the MoP.

ACAP performance indicators relating to seabird bycatch are still under development (MoP4 Final Report), and it is proposed that performance metrics and the more detailed assessments described above would be ideal candidate indicators for the Agreement.

2.4. Additional considerations

Although this document does not include details of what data should be collected, this has been covered in earlier phases of the bycatch data reporting process, and associated documents. It has also been considered in the process to develop data collection requirements for RFMOs (see SBWG-4 Doc 26 and Doc 27, and also SBWG-5 Doc 23. It is important, however, to highlight that Parties should be following the best practice advice for minimum data standards and observer coverage that has been developed by ACAP for use in RFMOs. Indeed if we are to progress matters within RFMOs, ACAP Parties should be leading by example.

The focus of this document, and the initial priority, is on bycatch data collected and reported by Parties for fisheries under their jurisdiction. However, the analytical and assessment framework proposed should be designed so as to receive and use data from other fisheries (e.g. from RFMOs), as well.

Although this document and the objectives of the bycatch data reporting process focus on the assessment and monitoring of seabird bycatch rates, and the efficacy of bycatch mitigation measures, we have highlighted the value of assessing the impacts of fisheries on ACAP species and populations. In addition to the data on seabird bycatch and associated fishery information, such an assessment framework would need to incorporate population trend and demographic and foraging distribution data. If the Working Groups and the Advisory Committee support such an approach, the process to develop the assessment framework should investigate how best to link these different data sets.

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ANNEX 1

Annual fishing effort – 2010 to 2012 (but data for some fisheries available starting 2004).

Fishery		Gear type	Effort Unit	2010	2011	2012
ARGENTINA	Congeladores - Centolla y Centollon	no data				
	Congeladores - Merluza de Cola, Polaca y Merluza Negra	no data	observed sets			
	Congeladores - Merluza Hubbsi	no data	observed sets			
	Congeladores - Palangreros	no data				
	Congeladores - Poteros	no data				
	Congeladores - Tangoneros	no data	hauls			
	Congeladores - Vieira	no data				
	Costeros - Flota Amarilla de Rawson	no data				
	Costeros - Merluza Hubbsi	no data				
	Costeros - Pelagicas - Red de Media Agua	no data				
	Costeros - Trampas	no data				
	Costeros - Variado Costero	no data				
	Fresqueros Altura - Merluza Hubbsi	no data	observed sets			
	Rada O Ria - Merluza Hubbsi	no data				
	Rada O Ria - Merluza Hubbsi - Palangre	no data				
	Rada O Ria - Variado Costero	no data				
AUSTRALIA	Eastern Tuna and Billfish	Longline - pelagic	hooks set	7874863	6761856	6548363
	Gillnet, Hook & Trap - longline sector	Longline - demersal	hooks set	5526606	5387783	5972813
	Great Australian Bight Trawl Sector	Trawl - demersal & pelagic	tows	3160	3832	4130
	Heard Island & McDonald Islands - Longline	Longline - demersal	hooks set	3391050	4423500	4449825
	Heard Island and McDonald Islands - Trawl	Trawl - demersal	tows	1004	652	859
	Macquarie Island - Longline	Longline - demersal	hooks set	277050	983950	1095640
	Macquarie Island - Trawl	Trawl - demersal	tows	0	0	0
	South-East Trawl including Victorian Inshore Trawl	Trawl - demersal & pelagic	tows	22564	24171	22424
	Western Tuna and Billfish	Longline - pelagic	hooks set	619220	358442	635426
BRAZIL	Monkfish gillnet	gillnets/ set nets	hauls		425	256
	Pelagic Longline Fishery	Longline - pelagic	,observed hooks	4079846,33	129914	157071
CANADA	Commercial Pacific Halibut fishery (west coast of Canada)	no data	sets/tows			
	Commercial Pacific Salmon gillnet fishery	no data	sets (estimated by avg. no. sets and no. of boats)	76960		
	Commercial Rockfish (west coast of Canada)	no data	sets/tows			

	Fishery	Gear type	Effort Unit	2010	2011	2012
CHILE	Palangre pelágico de superficie. Flota artesanal	Longline - pelagic	hooks set	155361	241879	378165
	Palangre pelágico de superficie. Flota industrial	Longline - pelagic	hooks	1151248	695167	772719
	Southern hake, pesquería merluza del sur, flota palagrera industrial.	Longline - demersal	observed hooks,	13470940	8998633	
	Tootfish's fishery, Bacalao de profundidad Industrial	Longline - demersal	hooks set	13946627	16253890	
Ecuador	Artesanal Puerto de Santa Rosa	no data				
France	Pêcherie palangrière à la Légine Australe	Longline - demersal				
NEW ZEALAND	Deepwater trawl	Trawl - demersal	tows	6041		
	Demersal longline	no data	hooks, sets	19021		
	Inshore trawl	no data	tows	56364		
	Middle depth trawl	no data	tows	29453		
	Pelagic longline	no data	hooks, sets	2817		
	Pelagic trawl	no data	tows	2061		
PERU	Cerco : Pesca industrial de cerco para anchoveta	no data	trips with caugth			
	Espinel artesanal	no data	hooks set			
	Redes agalleras a la deriva	no data	sets			
SOUTH AFRICA	Demersal Shark Longline	no data				
	Hake Longline INSHORE	no data				
	Hake Longline OFFSHORE	no data				
	Patagonian Toothfish Longline	no data	hooks, pots			
	Pelagic Shark Longline	no data				
	Tuna / Swordfish Longline (South African vessels only)	no data				
	Tuna Longline Fishery - Joint Venture Vessels only	no data	hooks set	3545078		
SPAIN	Atlántico Central-Este dirigido a la merluza	Longline - demersal Trawl - demersal				
	Palangre de Superficie dirigida a pez espada O. Atlántico	no data				
	Palangre de Superficie dirigida a pez espada O. Índico	no data				
	Palangre de superficie dirigido a grandes pelágicos del Mediterráneo (pez espada y atún rojo)	no data				
	Palangre de Superficie Pacífico	no data				
	Pesquería• de Cerco dirigida a Atunes Tropicales Océano Atlántico, Índico y Pacífico	no data				
	Pesquería de Palangre de fondo	no data				
	Pesquerías Lejanas Arrastre Gran Altura Norte	no data				
	Pesquerías Lejanas: Malvinas [Falklands][1]. Arrastre de Gran Altura	no data				

	Fishery	Gear type	Effort Unit	2010	2011	2012
UNITED KINGDOM	Bluenose/Bluefish (*Hyperoglyphe antarctica*) - Tristan da Cunha	Longline - demersal	hooks set	0	0	0
	Demersal longline fishery for Patagonia toothfish (*Dissostichus eleginoides*) - Falkland Islands [Islas Malvinas][1]	Longline - demersal	hooks hauled	2169068	2809250	
	Demersal longline fishery for Patagonian toothfish - South Georgia [Islas Georgias del Sur][1]	Longline - demersal	hooks set	13479391	9770560	10020088
	Finfish demersal trawl fishery - Falkland Islands [Islas Malvinas][1]	Trawl - demersal	vessel days fishing	3772	3548	
	Finfish pelagic trawl fishery - Falkland Islands [Islas Malvinas][1]	Trawl - pelagic	vessel days fishing	69	49	
	Illex argentinus jig fishery - Falkland Islands [Islas Malvinas][1]	squid jig	vessel days fishing	4684	8417	
	Loligo gahi demersal trawl fishery - Falkland Islands [Islas Malvinas][1]	Trawl - demersal	vessel days fishing	1970	1899	
	Trawl fishery for Antarctic krill (South Georgia [Islas Georgias del Sur])[1]	Trawl - pelagic	tows	414	3004	2497
	Trawl fishery targeting Icefish (*Champsocephalus gunnari*) in CCAMLR 48.3 (South Georgia [Islas Georgias del Sur])[1]	Trawl - pelagic	tows	14	97	281
URUGUAY	Arrastre de fondo (Merluza *común M. hubbsi*)	Trawl - demersal				
	Palangre de fondo (Merluza Negra)	no data				
	Palangre pelágico	Longline - pelagic				
USA	Alaska demersal longline	Longline - demersal	hooks set			
	Alaska Demersal Groundfish Trawl	Trawl - demersal				
	At-Sea Hake Trawl (Motherships & Catcher Processors; U.S. West Coast)	Trawl - demersal	hauls			
	Limited Entry Sablefish-endorsed Fixed Gear (U.S. West Coast)	pots/traps	landings of target species (mt)			
	Open Access Fixed Gear (U.S. West Coast)	no data	landings of target species (mt)			
	Pacific halibut (Alaska)	Longline - demersal	hooks hauled	64764498	55707464	
	Hawaii-based Pelagic Longline, Deep Set	Longline - pelagic	hooks set	31891124	40719827	
	Hawaii-based Pelagic Longline, Shallow Set	Longline - pelagic	hooks set	1828529	1611395	1418843

[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 y Islas Sandwich del Sur) and the surrounding maritime areas".*

ANNEX 2

Bycatch data for latest fishing year available, as reported by Parties and Range States. Note that "**ID'ed Albatrosses caught"** and **"ID'ed ACAP Petrels caught"** is the minimum number, as unidentified albatrosses or petrels are not included in these columns.

Fishery		Year	Annual Effort	Annual Effort Unit	Observed effort	Observed effort Unit	% observed	Observed bycatch rate	Estimated/ observed total birds caught (annual)	estimated/ observed	ID'ed Albatrosses caught	ID'ed ACAP Petrels caught
ARGENTINA	Congeladores - Merluza de Cola, Polaca y Merluza Negra	2009	3050	observed sets	0	sets hauled	0		-		-	-
	Congeladores - Merluza Hubbsi	2010			171	sets hauled		0.2105	36	observed	31	2
	Congeladores - Palangreros	2011			6461271	hooks		0.0079	51	observed	2	1
	Congeladores - Tangoneros	2011			1420	sets hauled		0.0148	21	observed	3	0
	Costeros - Flota Amarilla de Rawson	2011			549	sets hauled		0.0128	7	observed	-	-
	Fresqueros Altura - Merluza Hubbsi	2011			164	sets hauled		0.1037	17	observed	0	1
	Rada O Ria - Merluza Hubbsi - Palangre	2009	1427						0	observed	0	0
AUSTRALIA	Eastern Tuna and Billfish	2012	6548363	hooks set	368242	hooks	5.6	0	0	observed	0	
	Gillnet, Hook & Trap-longline	2012	5972813	hooks set	512509	hooks	8.6	0.1698	87	observed	6	3
	Great Australian Bight	2012	4130	tows	174	tows	4.2	0	0	observed	0	0
	Heard Island & McDonald Islands - Longline	2012	4449825	hooks set	4449825	hooks	100	0.0007	3	observed	0	2
	Heard Island and McDonald Islands - Trawl	2012	859	tows	859	tows	100	0	0	observed	0	0
	Macquarie Island - Longline	2012	1095640	hooks set	1095640	hooks	100	0	0	observed	0	0
	Macquarie Island - Trawl	2009	174	tows	174	tows	100	0	0	observed	0	0
	South-East Trawl including VIT	2012	22424	tows		tows			6	observed	5	0
	Western Tuna and Billfish	2012	635426	hooks set	115117	hooks	18.1	0	0	observed	-	-
BRAZIL	Monkfish gillnet	2012	256	hauls	54603	netting fishing observed (each of around 45m)		0.0038	210	observed	0	0

	Fishery	Year	Annual Effort	Annual Effort Unit	Observed effort	Observed effort Unit	% observed	Observed bycatch rate	Estimated/ observed total birds caught (annual)	estimated/ observed	ID'ed Albatrosses caught	ID'ed ACAP Petrels caught
	Pelagic Longline Fishery	2012	157071	observed hooks	8,02%	percentual of observed hooks of average of total hooks set estimated			572	observed	-	-
CANADA	Commercial Pacific Halibut fishery (west coast of Canada)	2009	5854	sets/tows	630	sets/tows	10.8	0.1889	111	Reported caught by fisher/other	11	0
CANADA	Commercial Pacific Salmon gillnet fishery	2010	76960	sets (estimated by avg. no. sets and no. of boats)	1112	sets hauled	1.4	0.0567	63	Reported caught by fisher/other	0	0
CANADA	Commercial Rockfish (west coast of Canada)	2009	4749	sets/tows	487	sets/tows	10.3	0.191	92	Reported caught by fisher/other	0	0
CHILE	Palangre pelágico de superficie. Flota artesanal. especie objetivo pez espada.	2012	378165	hooks set	340505	hooks	90	0	0	observed	0	0
CHILE	Palangre pelágico de superficie. Flota industrial	2012	772719	hooks	641387	hooks	83	0.0249	16	Estimated from observer	6	1
CHILE	Southern hake, pesquería merluza del sur, flota palagrera industrial.	2011	8998633	observed hooks					-		-	-
CHILE	Tootfish's fishery, Bacalao de profundidad Industrial	2011	16253890	hooks set					-		-	-
FRANCE	Pêcherie palangrière à la Légine Australe	2012							220	Estimated from extrapolati-on controleur - calendrier CCAMLR	-	-

	Fishery	Year	Annual Effort	Annual Effort Unit	Observed effort	Observed effort Unit	% observed	Observed bycatch rate	Estimated/ observed total birds caught (annual)	estimated/ observed	ID'ed Albatrosses caught	ID'ed ACAP Petrels caught
New Zealand	Deepwater trawl	2010	6 041	tows	1 575	tows	26.1	0.0051	8	observed	2	0
	Demersal longline	2010	19021	sets	726	sets hauled	3.8	0.1019	74	observed	2	55
	Inshore trawl	2010	56364	tows	706	tows	1.3	0.0085	6	observed	4	0
	Middle depth trawl	2010	29453	tows	5 129	tows	17.4	0.0425	218	observed	52	27
	Pelagic longline	2010	2817	sets	329	sets hauled	11.7	0.3982	131	observed	97	16
	Pelagic trawl	2010	2061	tows	545	tows	26.4	0.0073	4	observed	0	0
PERU	Cerco : Pesca industrial de cerco para anchoveta	2009	47773	trips with caugth	1164	sets hauled		0.5284	615	Estimated from observer	0	0
	Espinel artesanal	2010				hooks			-		-	-
	Redes agalleras a la deriva	2009	294652	sets					-		-	-
South Africa	Patagonian Toothfish Longline	2010		Hooks		total hooks observed			-		-	-
	Tuna / Swordfish Longline (South African vessels only)	2010			158345	total hooks observed		0.0001	19	observed	8	1
	Tuna Longline Fishery - Joint Venture Vessels only	2010	3545078	hooks set	3545078	total hooks observed		0	143	observed	31	100
SPAIN	Palangre de superficie dirigido a grandes pelágicos del Mediterráneo (pez espada y atún rojo)	2008	514363	observed hooks					47	Estimated from anecdotal	-	-
UNITED KINGDOM	Bluenose/Bluefish (*Hyperoglyphe antarctica*) - Tristan da Cunha	2008	219634	hooks set	78288	hooks	35.6	0.5109	40	observed	0	0
	Demersal longline fishery for Patagonia toothfish (*Dissostichus eleginoides*) - Falkland Islands [Islas Malvinas][1]	2011	2809250	hooks hauled	74714	hooks	2.7	0	0	observed	-	-
	Demersal longline fishery for Patagonian toothfish - South Georgia [Islas Georgias del sur][1]	2012	10020088	hooks set	3491106	hooks	34.8	0.0006	2	observed	1	1
	Finfish demersal trawl fishery - Falkland Islands [Islas Malvinas][1]	2011	3548	vessel days fishing	153	fishing days observed	4.3	0.183	28	observed	25	3
	Finfish pelagic trawl fishery - Falkland Islands [Islas Malvinas][1]	2011	49	vessel days fishing	7	fishing days observed	14.3	0	0	observed	-	-
	Illex argentinus jig fishery - Falkland Islands [Islas Malvinas][1]	2011	8417	vessel days fishing	101	fishing days observed	1.2	0	0	observed	-	-

	Fishery	Year	Annual Effort	Annual Effort Unit	Observed effort	Observed effort Unit	% observed	Observed bycatch rate	Estimated/ observed total birds caught (annual)	estimated/ observed	ID'ed Albatrosses caught	ID'ed ACAP Petrels caught
	Loligo gahi demersal trawl fishery - Falkland Islands [Islas Malvinas][1]	2011	1899	vessel days fishing	46	fishing days observed	2.4	0	0	observed	-	-
	Trawl fishery for Antarctic krill (South Georgia [Islas Georgias del Sur][1])	2012	2497	tows					0	observed	-	-
	Trawl fishery targeting Icefish (*Champsocephalus gunnari*) in CCAMLR 48.3 (South Georgia [Islas Georgias del Sur][1])	2012	281	tows					0	observed	-	-
Uruguay	Palangre pelágico	2007							403	Estimated from observer and logbook	343	60
USA	Alaska demeresal longline	2011							-	Estimated from observer and landings data	400	0
	Alaska Demersal Groundfish Trawl	2011							348	Estimated from observer and landings data	0	0
	At-Sea Hake Trawl (Motherships & Catcher Processors, U.S. West Coast)	2009	1872	hauls	1863/47%	hauls sampled/ %catch sampled on sampled hauls			0	observed	1	0
	Limited Entry Sablefish-endorsed Fixed Gear (U.S. West Coast)	2009	1889	landings of target species (mt)					0	observed	-	-
	Open Access Fixed Gear (U.S. West Coast)	2009	938	landings of target species (mt)	2.70%	percent of landings observed			0	observed	-	-

	Fishery	Year	Annual Effort	Annual Effort Unit	Observed effort	Observed effort Unit	% observed	Observed bycatch rate	Estimated/ observed total birds caught (annual)	estimated/ observed	ID'ed Albatrosses caught	ID'ed ACAP Petrels caught
	Pacific halibut (Alaska)	2011	55707464	hooks hauled					-		-	-
	Hawaii-based Pelagic Longline, Deep Set	2012							72	observed	65	0
	Hawaii-based Pelagic Longline, Shallow Set	2012	1418843	hooks set	100%	hooks	100	0.0691	98	observed	98	0

[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 y Islas Sandwich del Sur) and the surrounding maritime areas".*