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Proposal for a Bycatch Data Exchange Protocol (BDEP) amongst the t-RFMOs

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Abstract

A meeting of invited experts, convened in January 2015 in Keelung, Taiwan, to progress elements of the Work Plan agreed by the Joint Tuna RFMOs Technical Working Group-Bycatch, recommended that the Commission for the Conservation of Southern Bluefin Tuna (CCSBT) Ecologically-Related Species Working Group's data exchange be expanded to include all five tuna RFMOs. Compiling basic metadata across the tuna RFMOs aims at i) understanding and harmonizing tuna RFMO bycatch data holdings; ii) reviewing and improving bycatch data collection and reporting programmes ; and iii) planning for intra- and inter-RFMO analysis of bycatch rates and mitigation effectiveness. The proposed t-RFMO bycatch data exchange protocol (BDEP) consists of i) a summary of the total fishing effort and total observed effort for each area by fishery and year; and ii) a summary for the same strata (area, fishery and year) of observed captures, mortalities and live releases of various taxa known to be vulnerable to interactions with tuna fisheries. It is understood that a lack of taxonomic identification, spatial resolution constraints, scarce data holdings and other technical and policy issues may limit the data that some t-RFMOs can provide. Nevertheless, initiating a flow of summarized information and taking stock of existing datasets is an important first step toward harmonization and improved management. WCPFC is invited to consider what bycatch data could be contributed to the BDEP.

1 Background and Objectives

At the most recent meeting of the Joint Tuna Regional Fisheries Management Organizations' (Joint t-RFMOs) Technical Working Group-Bycatch (TWG-BYC) all of the t-RFMOs and taxa experts present agreed that data was the major issue for management and mitigation (Anon. 2011). Data sharing, subject to the applicable data confidentiality controls, was discussed throughout the meeting as a worthy goal. The importance of data sharing was echoed at a meeting of invited experts, convened in January 2015 in Keelung, Taiwan, to progress elements of the Work Plan agreed by TWG-BYC (Anon. 2015). The workshop agreed that data sharing would facilitate more systematic planning of analyses of bycatch interaction rates and mitigation effectiveness, as well as regular review and refinement of data collection programs.

It was noted by the Keelung group that one of the t-RFMOs, i.e. the Commission for the Conservation of Southern Bluefin Tuna (CCSBT) agreed a data exchange protocol for ecologically-related species (ERS) in 2012. Data for 2010-2012 were submitted in 2013 and CCSBT members now annually submit data in July for the previous calendar year. These data include effort, observed effort, observed bycatch rates and mortalities. Total estimated bycatch mortalities are summarized for each combination of fishery (gear and fleet) and CCSBT statistical area. Four groups of sharks (blue, shortfin mako, porbeagle and other), all species of sea turtles, and five groups of seabirds (large albatrosses, dark-coloured albatrosses, other albatrosses, giant petrels and other seabirds) must be reported (CCSBT 2015). The CCSBT Secretariat prepares annual summaries for longline and purse seine fisheries (all fleets aggregated) in each CCSBT statistical area showing effort, observed effort, observed mortalities and total estimated mortalities for each group of sharks, turtles and seabirds.

The Keelung group proposed that the CCSBT ERS data exchange be used as a model for a global bycatch data exchange protocol (BDEP) amongst the t-RFMOs (Anon. 2015). This initiative would serve multiple objectives:

- Highlighting opportunities for harmonization – by understanding similarities and differences between current t-RFMO bycatch data holdings;
- Promoting rationalization and efficiency in monitoring programmes – by focusing future bycatch data collection and reporting programmes where they are most needed; and
- Addressing concerns about impacts to bycatch populations – by progressing toward regional analyses of bycatch rates and mitigation effectiveness for highly migratory species by improving the quantity and quality of data available.

2 How It Would Work

2.1 The Format

The proposed format for the BDEP is a simplified version of the existing CCSBT ERS data exchange format. t-RFMOs are first requested to provide effort and observed effort by year, fishery and area (Table 1). As explained in the footnotes, the fisheries may be aliased and may represent a combination of flags but should be separated into the major gear types. It would be desirable to report at a 5x5 degree resolution, but if this is not possible larger statistical areas may be used. Effort may be defined using a variety of metrics but which metric is used should be specified along with any details of any data raising (extrapolation) procedures that were applied. The observer coverage column can be filled in with a simple calculation of the ratio of observed to total effort or can be based on other more complex methods.

The second table consists of the bycatch interaction and mortality reporting (Table 2). The taxonomic specificity of the CCSBT Data Exchange format is maintained for sea turtles and seabirds but the groups of sharks have been expanded to reflect those which have been designated as "key" sharks or for which there are current management measures. As in Table 1 fishery and area information may be aggregated as necessary. The remaining column headings (Table 2, green shading) are identical to those in the CCSBT Data Exchange format. It is noted that the list of taxa in Table 2 represents the minimum level of taxonomic specificity requested; more detailed taxonomy should be provided if available.

2.2 The Process

The Chair of the Joint t-RFMOs Technical Working Group-Bycatch has written to each t-RFMO Secretariat outlining the proposed t-RFMO BDEP and proposing that data for 2013, 2014 and 2015 be prepared by 31 July 2016. Years for which data compilation is still in progress will vary among the t-RFMOs and should be noted by each. Recognizing that data for recent years may change as incoming data are captured, unless otherwise requested, the most recent annual data provided would be considered to be the most accurate and up-to-date. It is understood that some t-RFMOs do not hold observer data; in such cases these t-RFMOs should consider forwarding the data exchange format to their members and compiling their responses (see Section 3.1). While such compilations may not be complete, the initial objective of the exchange is to start the flow of summarized information and to take stock of existing datasets, not to draw conclusions from partial information (see Section 3.3). It is expected that each respondent t-RFMO will provide data only in formats that adhere to its own specific set of confidentiality provisions. When providing the summaries the t-RFMOs are requested to highlight instances in which data exist but cannot be provided due to confidentiality provisions (see Section 3.2).

Table 1: Total fishing and observed effort per year, fishery and area

Calendar Year	Fishery Code[1]	Statistical area[2]	Total Effort[3]	Total Observed Effort	Observer Coverage (%)

Table 2: Observed and estimated captures/mortalities for each taxa by year, fishery and area

Calendar Year	Fishery Code[1]	Statistical area[2]	Species (or group)	Observed Captures (#)	Observed Capture Rate (per 1000 hooks or per set)	Observed Mortalities (#)	Observed Mortality rate (per 1000 hooks or per set)	Observed Live Releases
			Blue shark					
			Mako shark					
			Porbeagle shark					
			Oceanic whitetip shark					
			Silky shark					
			Thresher sharks					
			Hammerhead sharks					
			Whale shark					
			Other sharks					
			Green turtle					
			Hawksbill turtle					
			Flatback turtle					
			Loggerhead turtle					
			Kemp's ridley turtle					
			Olive ridley turtle					
			Leatherback turtle					
			Large albatrosses[4]					
			Dark coloured albatrosses[5]					
			Other albatrosses[6]					
			Giant petrels[7]					
			Other seabirds[8]					

[1] If possible, assign each fleet + gear type combination an alias and list separately. If not possible, aggregate by gear types only.

[2] If possible, at a 5x5 degree scale. If not possible, aggregate by the most precise spatial metric that can be provided according to applicable data confidentiality procedures.

[3] Please define the metric used, whether the data have been raised, and any other special features of the data relevant to understanding what is represented.

[4] Including wandering, Tristan, New Zealand, antipodean ,southern royal and northern royal

[5] Including sooty and light-mantled

[6] Including black-browed, Campbell, grey-headed, Atlantic yellow-nosed, Indian yellow-nosed, Buller's, shy, Salvin's, Chatham and white-capped

[7] Including white-chinned petrel, grey petrel, flesh-footed shearwater etc.

[8] Including skua, etc.

CCSBT has agreed to be the initial repository for the BDEP. Each t-RFMO Secretariat would submit Tables 1 and 2 to the CCSBT Data Manager each year. These submissions will be summarized into a global summary (i.e. similar to how CCSBT currently provides an annual summary by year and gear across all of its participating members). In the first instance, the submissions will be held confidentially by CCSBT who will circulate the global summary amongst the t-RFMO Secretariats only. If approved for release by the data owner (i.e. release of the global summary would require the approval of all contributing t-RFMOs) could be posted on a public website similar in form to that now used by the Consolidated List of Active Vessels (CLAV, clav.iotc.org), i.e. separate, though perhaps nested within one of the t-RFMOs. It is important to note that the global summary is intended to represent a simple tally of the results from all five tuna RFMOs, i.e. without any attempt to remove double-counting or estimate any missing data. While it may therefore serve as an inventory and perhaps an indicator of relative trends, it will not necessarily accurately reflect absolute global figures. Any t-RFMO members who wish to participate in the exchange directly, i.e. without sending their data through the relevant t-RFMO, may also submit their BDEP summary to CCSBT and it can be posted alongside the t-RFMO global summary. A schematic of the proposed data exchange flow is illustrated in Figure 1.

3 Potential Issues

It is anticipated that there will be many issues raised by the BDEP as it charts new territory in international bycatch data sharing. It is therefore important to bear in mind that it represents a starting point for discussion and once initiated can be refined as practical experience accumulates. Consideration of potential issues related to data holdings, confidentiality restrictions and appropriate use of the data are discussed in more detail below.

3.1 Data Holdings

Although one of the objectives of the BDEP is to construct an inventory of global bycatch data for tuna fisheries, there are concerns that simply compiling information from the five t-RFMOs will not make significant progress toward that goal. In particular, some t-RFMOs do not hold data on bycatch interaction and mortality rates themselves, rather these data are held by national observer programmes. Other sources of data that are held by t-RFMOs either do not record all bycatch (e.g. logsheets may record some types of sharks only) or are in highly summarized, qualitative formats (e.g. national annual reports). Some t-RFMOs are in the process of compiling relevant data but are experiencing time lags and thus the data are not up to date. For these and potentially other reasons there will be cases in which the t-RFMO holdings represent only a portion of the existing bycatch data.

While this concern may be pertinent to the long-term goal of completing a comprehensive inventory of all relevant data, it should not prevent commencing the data exchange protocol as an initial survey of data holdings. There is also nothing to prevent national programmes from contributing bycatch summaries directly, i.e. even if their national observer programme data are not routinely providing such summaries to the t-RFMOs. Furthermore, agreeing to participate in the BDEP is a voluntary step and does not represent any new commitment on the part of each t-RFMO to require that new or different data be collected. In other words, each t-RFMO would continue to operate under its existing observer programme standards and data provision requirements. Even if none of the t-RFMOs can provide all of the data requested, the data exchange still provides a very useful way of comparing the types and quantities of data holdings between the t-RFMOs and over time. In addition, by accepting non-tRFMO contributions (i.e. from national programmes) the data exchange also provides a template for even broader integration of bycatch data sources.

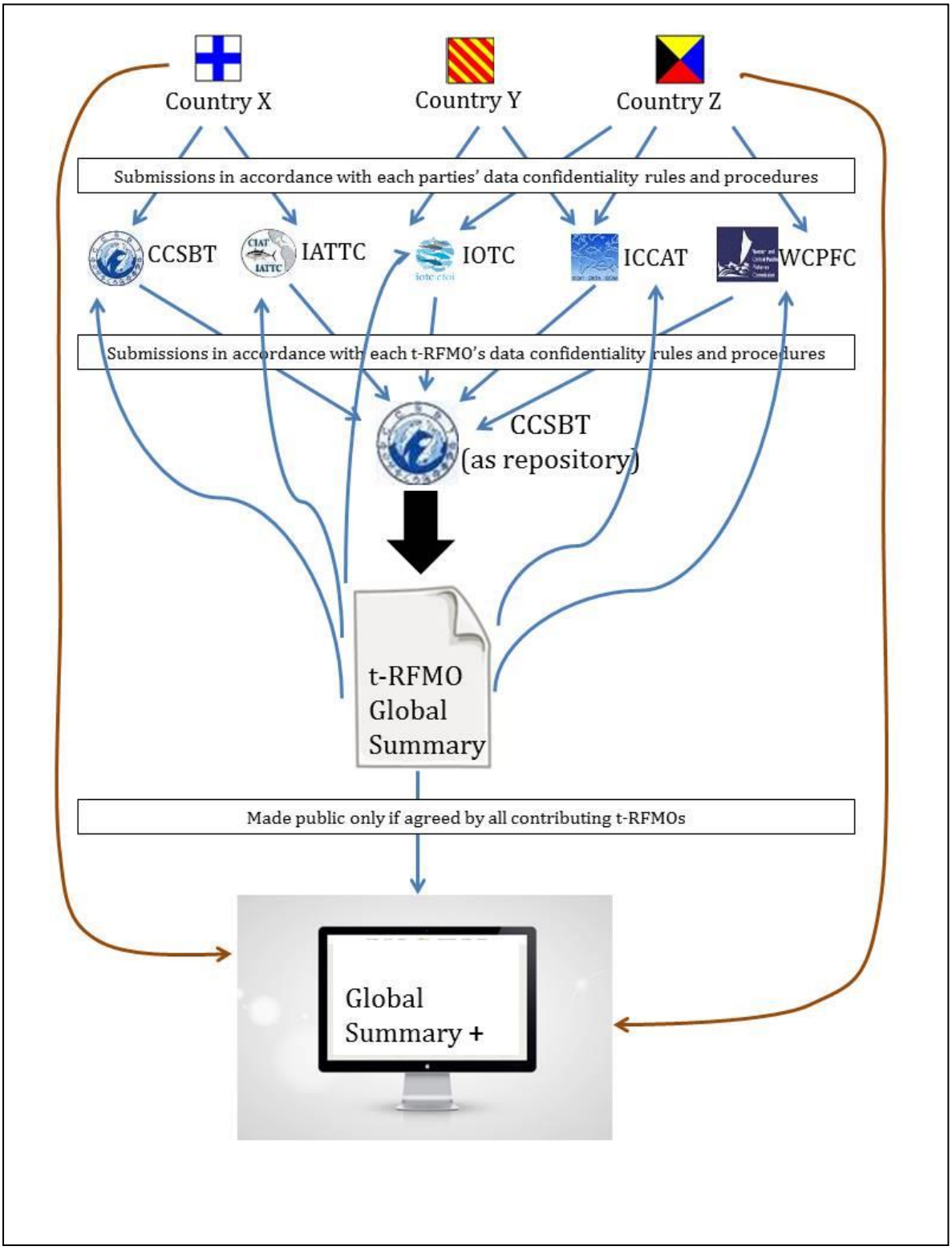

Figure 1. BDEP schematic showing the flow of data from countries, either directly (brown arrows) or via t-RFMOs (blue arrows), into a global summary.

3.2 Confidentiality Restrictions

Another potential concern about the data exchange is that for some t-RFMOs bycatch data are not considered to be in the public domain. Depending on the specific rules applicable within each t-RFMO, there are certain types of data that cannot be shared because of their spatial resolution (e.g. operational-level data), the number of vessels involved (e.g. must be a minimum of three vessels), or vessel status (e.g. information on flag or charter status). It is possible that some or all of these restrictions may impinge on the ability of some of the t-RFMOs to respond to the BDEP. However, since the data exchange protocol is based on one already implemented by CCSBT, and all CCSBT members submitted data in accordance with the protocol last year, it would appear to be a workable starting point.

When responding to the data exchange protocol, data confidentiality issues will need to be considered by each t-RFMO. In this regard, it is noted that some t-RFMOs already have procedures for data exchange with other RFMOs. More importantly, it should be recognized that a response to the currently proposed BDEP would consist of data summaries, not raw data. As proposed these summaries already envisage aggregating the data to whatever spatial resolution is possible to provide, and allow for aliasing of fleet information if necessary. Several countries, including those with strict national data confidentiality rules, already make summarized bycatch data available in the public domain, for example:

- New Zealand publishes bycatch rates at a 0.2x0.2 resolution in its New Zealand Protected Species Bycatch Database (Abraham & Thompson 2012); and
- The United States publishes annual summaries of bycatch data (all species) by gear type, fishery, area and quarter (NOAA 2011).

SPC has also published analyses of bycatch species' interaction rates at a spatially aggregated resolution, for example:

- For sea turtle interactions (Williams et al. 2009); and
- For shark interactions (Clarke et al. 2011).

These examples are not provided to pre-judge WCPFC's ability to respond to the proposed data exchange protocol; rather they are cited to demonstrate that some bycatch data of a similar resolution is already in the public domain. Pulling these data into Tables 1 and 2 is an essential first step in summarising data for the key bycatch species for which WCPFC has management responsibility. It should be noted that the provision of some information required in Table 2 (when aggregated at the annual level) corresponds to CCM flag State reporting requirements in WCPFC CMMs for shark[9], sea turtle[10] and seabird[11] species for the

[9] CMMs 2010-07 (http://www.wcpfc.int/doc/cmm-2010-07/conservation-and-management-measure-sharks), 2011-04 (http://www.wcpfc.int/doc/cmm-2011-04/conservation-and-management-measure-oceanic-whitetip-sharks) and 2013-08 (http://www.wcpfc.int/doc/cmm-2013-08/conservation-and-management-measure-silky-sharks) http://www.wcpfc.int/doc/cmm-2012-07/conservation-and-management-measure-mitigating-impacts-fishing-seabirds

[10] CMM 2008-03 (http://www.wcpfc.int/doc/cmm-2008-03/conservation-and-management-sea-turtles)

[11] CMM 2012-07 (http://www.wcpfc.int/doc/cmm-2012-07/conservation-and-management-measure-mitigating-impacts-fishing-seabirds)

WCPFC Convention Area. The compilation of this information in Table 2 is therefore a logical first step toward summarizing required information.

3.3 Data Quality and Uncertainty

There may also be concerns regarding inappropriate use of the data gathered by the BDEP. The available data may not be representative of the fisheries they are drawn from (e.g. due to low observer coverage, or incomplete submissions from programmes with higher observer coverage), and taxonomic reporting may be unreliable. Such data quality issues are magnified when extrapolations are made to a fishery or region as a whole. As result, there is potential for summarized data to be misused and for erroneous conclusions to be drawn.

These are valid data quality concerns. However, if t-RFMOs are to responsibly manage bycatch of highly migratory species it is necessary for them to work toward improved data quality. The first step in this process is to take stock of the quantity and quality of available data and the BDEP seeks to do just that. The data holders are not required to extrapolate their data, but if they wish to do so, they can choose and document their own methods. Uncertainties about taxonomic identifications can also be noted. Once the data summary is prepared by CCSBT, the t-RFMOs themselves can determine whether any or all of that information can be made public as well as attach any cautions about usage (Figure 1). Even if none of the data are released into the public domain in the first few years, the exercise will inform the t-RFMOs themselves about data gaps and issues allowing improvements to be made, perhaps across t-RFMOs. Eventually, t-RFMOs may be able to contribute to improved quality in public domain bycatch data and thereby reduce the number of studies which are based on very limited data and unrealistic assumptions.

4 Recommendations

The Scientific Committee has periodically requested its Scientific Services Provider to compile a summary of non-target species interactions with the tuna fisheries of the WCPO (e.g. SPC-OFP 2010) on an *ad hoc* basis. The BDEP proposal is a continuance of this work, but on a more permanent, ongoing basis.

WCPFC SC11 is invited to consider supporting the BDEP recommended by the Keelung group by **recommending**:

1. The preparation of summaries (as per Tables 1 and 2 on page 3 of this paper) of the non-target species interactions within the tuna fisheries of the WCPO from the WCPFC ROP database on an annual basis. These summarized data would need to conform to the *WCPFC Rules for the Protection and Dissemination of Data Compiled by the Commission* (see http://www.wcpfc.int/doc/data-02/rules-and-procedures-protection-access-and-dissemination-data-compiled-commission) to ensure they can be disseminated in the public domain;
2. Investigation of the most appropriate aggregation to produce public-domain level data (required in Tables 1 and 2 on page 3 of this paper) that maximizes spatial and temporal coverage while not removing too many cells (due to the three-vessel rule);

3. The presentation of the first data summaries to WCPFC SC12 which would cover the available observer data collected over the period 2013-2015. The WCPFC Scientific Services Provider will liaise with the ABNJ Tuna Project to address the data quality control and resource constraint issues that may arise in compiling and providing these summaries.

WCPFC SC11 is invited to further consider supporting the BDEP recommended by the Keelung group by **requesting CCMs**:

1. To please consider providing permission to the WCPFC Scientific Services Provider for inclusion of their non-ROP (Regional Observer Programme) data in the data summaries.

5 References

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