Indian Ocean Tuna Commission
Commission des Thons de l'Océan Indien
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IOTC–2016–WPDCS12–28 Rev_1

A BYCATCH DATA EXCHANGE PROTOCOL FOR THE INDIAN OCEAN

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PURPOSE

To provide the WPDCS with the opportunity to review experiences with populating the Bycatch Data Exchange Protocol template with data from IOTC fisheries, provide suggestions for adaptation of the templates for IOTC fisheries and discuss the issues involved.

BACKGROUND

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 (ISSF 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.

The Keelung group proposed a model for a global bycatch data exchange protocol (BDEP) amongst the t-RFMOs, an initiative that 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.

As such, a proposal was subsequently developed by the Chair of the Joint t-RFMOs Technical Working Group-Bycatch with the Technical Coordinator-Sharks and Bycatch for the ABNJ (Common Oceans) Tuna Project for consideration by the tuna RFMOs. This was presented to the IOTC Working Party on Ecosystems and Bycatch in September 2015 in paper IOTC-2015-WPEB11-41. Following review and discussion by the group:

> *"The WPEB **REQUESTED** the IOTC Secretariat collate the observer data available, using the BDEP template as a trial format and aggregating data according to the guidelines in Resolution 12/02 Data confidentiality policy and procedures and present this for review at the next WPEB meeting".* IOTC-2015-WPEB11-R (Para. 33).

In response to this request, the IOTC Secretariat cleaned, collated and formatted an example set of observer bycatch data into the Bycatch Data Exchange Protocol (BDEP) template as described in the proposal "Proposal for a Bycatch Data Exchange Protocol (BDEP) amongst the t-RFMOs" (IOTC-2015-WPEB11-41) and presented this to the

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WPEB12 in 2016. The working party noted that there were a number of issues with collating the historical observer data into the requested format, most of which were overcome when using the data reported according to the new interim reporting requirements. Based on this, the working party decided the following:

> ***"ACKNOWLEDGING** the benefits of producing globally compatible datasets among the tRFMOs, the WPEB **AGREED** to continue to trial the BDEP template to support harmonisation initiatives.*
>
> *The WPEB **RECOMMENDED** that, on completion of the development of the ROS database and the input of all of the historical data, the IOTC Secretariat continue to populate the BDEP template, adapting it where necessary, and present this to the WPDCS and SC for further review"* (para. 61-62, IOTC-2016-WPEB12-R).

In response to this recommendation, this working paper has been prepared for WPDCS12 to report on the methods for compiling the template, issues identified in compiling the data and recommendations for future work for review by the WPDCS12.

DISCUSSION

Data format

The proposed t-RFMO bycatch data exchange protocol (BDEP) consists of two tables providing:

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.

Observer data submitted to the IOTC Secretariat are subject to the confidentiality policies and procedures as outlined in Resolution 12/02, para. 2.c:

"Observer data grouped by 1° longitude by 1° latitude for surface fisheries and by 5° longitude by 5° latitude for longline, stratified by month and by fishing nation are considered to be in the public domain, provided that the activities /catch of no individual vessel can be identified within a time/area stratum";

therefore, where observer data have been reported, the IOTC Secretariat can make this available for global exchange purposes in the aggregate format requested for the BDEP in Tables 1 and 2.

Progress and issues arising

This process charts new territory in international bycatch data sharing and so there are a number of issues arising that need addressing.

Spatial information on observed effort

Observed effort has historically been reported by trip rather than by 5x5 or 1x1 grid square for the majority of fleets. Nevertheless, this issue has been overcome with the interim reporting templates agreed in 2014 and so this information can now be provided to complete Table 1 for the more recently submitted datasets.

Mortality information

Information on mortality is requested in Table 2 for all bycatch species reported, however, for historic data this information is only usually provided for non-fish species, i.e. marine turtles, seabirds and marine mammals. For the more recently submitted data, mortality is recorded for all bycatch and so this information can be provided, including for shark species.

Catch units

Units are used inconsistently when observer data are reported, resulting in the same bycatch species sometimes reported by numbers and at other times by weight by the same fleet. This could either be overcome by adding columns to Table 2 to be able to report in either weight or number, or by using an approximation such as an average weight and clearly indicating this in explanatory text surrounding the table.

Total Effort

Total effort exerted in the Indian Ocean is only reported for some fleets, whereas others report a sample of the total effort or none at all. There is also great variety in the units provided when fleets report effort data, for purse seine fleets in particular (e.g. fishing days, fishing hours, hours). The IOTC Secretariat currently estimates total effort for non-reporting fleets based on ratios of nominal catches to spatially reported catch and effort information. Where the spatial catch and effort information is unavailable, ratios from other time periods or from proxy fleets are used instead (IOTC-2016-WPEB12-09). These estimates are not spatially disaggregated, but rather provide an annual estimate for the entire Indian Ocean. The Secretariat could either provide only reported values to complete Table 1, noting that much information would be incomplete or missing and therefore potentially leading to misinterpretation by users, or alternatively provide estimated values that are aggregated where it has not been possible to generate spatially disaggregated estimates.

Observer data from foreign flagged vessels

There are a number of fleets which have observers implemented by another CPC, generally where foreign fleets are fishing within coastal EEZs and are required to carry a national observer onboard the vessel. Data must therefore be aggregated appropriately, based on the vessel flag rather than the flag of the nation submitting the data.

Potential for expansion

The original BDEP template provides a list of species to be reported on. Nevertheless, there is the potential for this to be expanded for use by the IOTC to include all species that are currently reported in observer data (e.g. including marine mammals). Given that the data should be reported in the same format, this addition should take little extra effort and could be beneficial for the work of WPEB.

Quality of observer data reported

Given the current stage of the observer data process (database development and data entry being undertaken), there has not yet been a review of the quality of observer data reported to the IOTC Secretariat. Based on experiences with the standard IOTC datasets (nominal retained catches, discards, spatial catch and effort data, size frequencies) there are likely to be some data quality issues that will need addressing prior to the release of any information.

Issues with extrapolating rare-event data

The sparse nature of the bycatch data reported poses issues when users perform extrapolations which may result in wild over or under-estimations of bycatch. While there is no such extrapolation column explicitly included within Tables 1 & 2 of the BDEP form, it is implicit within the nature of the information requested and, while this is primarily an issue for the user, there may need to be caveats associated any information that is publically disclosed to ensure that it is interpreted appropriately.

This discussion highlights the improvements to the regional dataset that can be gained when data are reported based on the new reporting format. This was acknowledged by the WPEB12:

> *"The WPEB **AGREED** that the usefulness of the summaries presented in the BDEP template is dependent on the quality and timelines of submission of CPC observer programme data to the Secretariat. Consequently, the WPEB **URGED** all CPCs to submit their observer data according to the minimum data reporting requirements agreed at SC17 detailed on the IOTC website [www.iotc.org/science/regional-observer-scheme-science]". (para. 60* IOTC-2016-WPEB12-R).

Utility of BDEP format

In early 2016, IOTC Circular 2016-043 *"Review of IOTC resolution 12/06 on reduction the incidental bycatch of seabirds in IOTC longline fisheries"* was distributed on behalf of the Chairperson and Vice-Chairpersons of WPEB with a call for data submissions and review papers. To assist with standardisation of data submissions, CPCs were requested to use Tables 3a and 3b as the format for submitting data. This was based on the CCSBT data exchange format and hence is very similar to Tables 1 and 2. If observer data collated at the regional level can be formatted based on the BDEP template then this type of summary and review will be possible without the need for a separate data call each time and these can be saved for when additional information beyond this summary level of data is required.

Experiences of other tRFMOs

In response to the proposal on a Bycatch Data Exchange Protocol, SPC prepared, formatted and published its bycatch datasets for review by the WCPFC Scientific Committee and plan to continue the project into 2017. A summary of the results of this trial application of the BDEP template in the western and central Pacific is provided in paper IOTC-2016-WPEB12-INF02. Within their recommendations were the plans to extend the protocol to include seabirds to the species level and to include marine mammals.

RECOMMENDATION/S

The WPDCS Recommend that the Scientific Committee:

1) Request that the BDEP trial should continue in 2017 for the Indian Ocean region and resourced as needed as a positive step toward improving the quality of and access to bycatch data within and across RFMOs.

REFERENCES

Anon. 2011. Report of the First Meeting of the Joint Tuna RFMO Technical working group on by-catch. La Jolla, California, USA -July 11, 2011. Accessed online at http://www.tunaorg.org/Documents/TRFMO3/RFMO%20TECH%20WG%20BY-CATCH_REP_ENG.pdf

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ISSF (International Seafood Sustainability Foundation). 2015. Harmonisation of Longline Bycatch Data Collected by Tuna RFMOs. Tuna RFMO Expert Working Group Meeting, 27-29 January 2015, Keelung, Taiwan. Accessed online at: http://iss-foundation.org/resources/downloads/?did=583

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

Calendar Year	Fishery Code[2]	Statistical area[3]	Total Effort[4]	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[5]					
			Dark coloured albatrosses[6]					
			Other albatrosses[7]					
			Giant petrels[8]					
			Other seabirds[9]					

[2] If possible, assign each fleet + gear type combination an alias and list separately. If not possible, aggregate by gear types only.
[3] 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.
[4] 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.
[5] Including wandering, Tristan, New Zealand, antipodean ,southern royal and northern royal (tabulated separately if possible)
[6] Including sooty and light-mantled (tabulated separately if possible)
[7] Including black-browed, Campbell, grey-headed, Atlantic yellow-nosed, Indian yellow-nosed, Buller's, shy, Salvin's, Chatham and white-capped (tabulated separately if possible)
[8] Including white-chinned petrel, grey petrel, flesh-footed shearwater etc. (tabulated separately if possible)
[9] Including skua, etc. (tabulated separately if possible)

Table 3a. Data submission template for Circular 2016-043

Fishery:		Observed			
Time period*					
Area[1]	Total effort[2] (hooks/sets)	Total observed effort[2] (hooks/sets)	Captures (number)	Mortalities (number)	Live releases (number)
Total					

*This field can be used to specify a temporal stratification to the data e.g. season.

[1]Spatial stratification at the finest scale possible.

[2] Effort should preferentially be provided in number of hooks, or sets where this is not possible.

Table 3b. Data submission template for Circular 2016-043

Species	Fate			Total caught
	Released alive	Released alive but in poor state	Dead	
Wandering albatross	1	0	3	4
White-chinned petrel	19	1	5	25
Shy albatross	1	2	13	16
Unidentified	4	5	1	10
Total	25	8	22	55