Report: Meeting on collaborative activities for cetacean bycatch, IOTC-IWC

Date: Tuesday 1st September 2020

Platform: Microsoft Teams

Chair: Sylvain Bonhommeau

Time: 12:00-16:00 CET (GMT+2)

1 Opening of the meeting

The Chair opened the meeting and explained about the origins of the meeting, noting that over a year ago, the International Whaling Commission (IWC) Secretariat contacted the Indian Ocean Tuna Commission (IOTC) Secretariat to discuss the issue of cetacean bycatch in the region and possible strategies for bycatch mitigation in Indian Ocean fisheries. The IWC's Bycatch Mitigation Initiative (BMI) held a workshop in 2019 dedicated to cetacean bycatch within the Indian Ocean region (IWC, 2020) which brought together stakeholders from across the Indian Ocean region as well as experts on bycatch. Representatives from the IOTC Working Party on Ecosystems and Bycatch as well as IOTC member countries participated in the 2019 workshop. This current meeting is a continuation of these discussions to identify collaborative work areas between the two organisations, their member countries and experts working within the region.

The agenda was adopted without comment. The Chair discussed the logistics of the meeting then asked each participant to briefly introduce themselves. The list of participants is in Annex I – List of Participants.

2 Introductory remarks by IOTC and IWC representatives

The IWC Secretariat provided a brief introduction to the issue of cetacean bycatch and IWC's Bycatch Mitigation Initiative (BMI). Cetacean bycatch is considered the most significant threat, globally, to the conservation of both small and large cetaceans. Bycatch and entanglement are known to occur in the majority of fishing gears, where fishing operations overlap with cetaceans, resulting in both a conservation and welfare issue. In recognition of the importance of this issue, the IWC established the Bycatch Mitigation Initiative in 2016 in order to raise global awareness of the issue of cetacean bycatch, and raise awareness and capacity to implement the available solutions for assessing, monitoring and reducing bycatch. The BMI is undertaking a collaborative and multi-disciplinary approach to addressing bycatch, with an emphasis on working in partnership with those involved in fisheries management. Its Expert Panel includes specialists in cetacean ecology and conservation, policy, fisheries technology, economics, social science, geography and fisheries management. The initiative is guided by its ten-year strategic plan and is focusing the majority of its efforts during this period on understanding and developing solutions for cetacean bycatch in gillnet fisheries - particularly in small-medium-scale, and artisanal fleets. The initiative features collaboration amongst a number of governments and experts around the world to develop 'pilot projects' for trialling multi-disciplinary approaches to bycatch management and to implement a capacity building programme.

In 2019 the BMI held a workshop in Nairobi, Kenya, on cetacean bycatch in the western Indian Ocean and Arabian Sea. This workshop identified a number of areas across the region where bycatch is either known to occur or assumed to be significant. The workshop proposed a number of recommendations, including: the need to strengthen bycatch assessments, data collection and monitoring and reduction

programmes; the need to prioritise monitoring and mitigation efforts at the regional level on gillnets; the need for data collection in small-scale fisheries, including the use of crew-based approaches; the need for multi-disciplinary work, including the integration of social and economic factors within mitigation approaches; and closer collaboration between IWC and IOTC in relation to sharing information, streamlining data reporting, capacity building and the development of a regional road map. The IWC was therefore happy to have the opportunity to discuss future collaborative activities during this meeting, and with the Working Party on Ecosystems and Bycatch.

The IOTC Secretariat thanked the IWC for their introductory presentation and expressed their willingness to work with the IWC on the topic of marine mammal bycatch but explained that they have very little information or updates to provide. The IOTC Secretariat highlighted that marine mammals have not been of high priority to the Commission, mainly due to the fact that papers focusing on marine mammals are rarely presented for discussion at the Working Party on Ecosystems and Bycatch (WPEB) meetings. As a result of this, recommendations regarding these species are rarely brought to the Commission following WPEB meetings. There is only one conservation Resolution specifically in place for cetaceans (*Resolution 13/04 On the conservation of cetaceans*) which has not been updated at all since it was first brought into force.

The IOTC Secretariat explained that data that are held in IOTC databases concerning marine mammals are scarce, mostly coming from the Regional Observer Scheme. There have been a total of 76 recorded interactions with mammals reported since the observer scheme was implemented. These were all recorded by observers onboard longline vessels (French, Japanese and Sri Lankan) and these figures are very low in relation to the level of interaction/bycatch that is actually believed to be taking place. It was clarified that interactions in the IOTC reporting context means the number of animals brought onboard then released. Observers are also meant to report sightings around fishing operations such as depredation as well but this is not done regularly meaning that valuable information on these other types of interactions is mostly lacking.

While reports have been submitted to the IOTC Secretariat by CPCs from sources such as the crew-based observer programme in Pakistan, many of these data have not been submitted in a format from which they can be easily extracted so there is a need for improved reporting mechanisms by CPCs.

This led into further discussions around data gaps as recorded below.

3 Known gaps in data and information on cetacean bycatch, fishing activity (gillnets, longlines, purse seines) in IOTC fisheries

3.1 Gaps in data and information

It was noted that while there is a paucity of data on cetacean bycatch or interactions (including depredation events) held by the IOTC Secretariat, there are some data available, for example, in the grey literature, particularly focusing on interactions with certain gear types (e.g. purse seines, longlines). In general, data on cetacean interactions have not been formally submitted to the IOTC Secretariat and therefore have not yet been compiled in a way that they can be easily interpreted and analysed, although this would be a very useful piece of work. It was also noted that some data which are published or available in the grey literature may be inconsistent with data held in the IOTC databases. The IOTC concluded that it is challenging because none of the data in these individual papers have been formally submitted to the IOTC through the required channels, specifically through the discards reporting form which CPCs are required to submit data on discarded animals. Instead,

data on interactions are sometimes reported through CPC National Reports where they are embedded within text so are difficult to extract efficiently.

The IOTC Secretariat highlighted that it does not have sufficient staff time to continually investigate whether relevant publications have data. It was also highlighted that the organisations and individuals who hold these data do not regularly attend IOTC meetings. Due to this lack of information held by the Secretariat or evidence of an issue with bycatch for cetaceans, the Commission have not had reason to discuss marine mammal bycatch as a first step in developing relevant science and stewardship measures. This joint IWC-IOTC meeting helps to bring attention to the need for data, and the meeting report will provide a means to formally flag the issue of marine mammal bycatch to the Commission.

The largest data gap identified was for the gillnet fleets, many which are artisanal in nature and so pose a major challenge for data collection and fleet classification.

3.1.1 Longlines

It was noted that the only data held by the IOTC on interactions with cetaceans have come from observers onboard longline vessels with a total of 76 recorded interactions held in the IOTC database. However, as noted above, these interactions only consist of instances of animals being brought onboard then discarded and there may well have been other types of interactions such as depredation by marine mammals on longline (and other) gear which have not been recorded due to the definition of interactions used.

3.1.2 Purse seine

There were differing views amongst participants on the level of interactions between the purse seine fleet and cetaceans. The data available suggest that there are very few interactions but anecdotal information suggests that there may have been a high level of interactions in the past which must be kept in mind for the purpose of evaluating cetacean population status. In particular it was noted that purse seiners in the past have been known to set on whale-associated schools of tuna, but this is thought to have mostly ended with the introduction of EU legislation prohibiting the practice of setting on mammals. However, observer coverage in the 1980s and 90s was very low and so these data are difficult to interpret.

Several relevant papers were highlighted including analyses of purse seine bycatch interactions for the Atlantic and Indian Oceans publications from 2002 (Romanov) and 2015 (Escalle et al.) which both showed minor interactions with cetaceans. A paper presented to WPEB in 2018 on the bycatch of the European purse seine fishery in the Indian Ocean based on observer coverage from 2008-2017 was also discussed (Ruiz et al., 2018). During this period just 15 cetacean catch events were reported by observers and these were mostly reported as baleen whales which were all released or escaped alive and in the vast majority of cases this happened before the net was retrieved. No dolphins were reported as being caught in this paper.

It was noted that in the Indian Ocean (unlike in areas of the Pacific), tuna associated with dolphins are generally not thought to be targeted by purse seiners but that further work to understand the extent of interactions between dolphins and tuna in the Indian Ocean would be useful. There is limited information about the association between tuna and dolphins in this region, with meeting participants noting known occurrences in the Maldives, Sri Lanka and much of the Arabian Sea, but the association

has been said to be uncommon in the core areas of the purse seine fishery. It was noted that purse seiners have not been submitting information about these interactions, but this absence of information cannot be used to confirm a lack of interactions.

It was suggested that there may be observer bias in fishing vessel activity and that there is a need for independent observers onboard vessels as well as electronic monitoring systems in order to provide an accurate account of the situation onboard these vessels. The IOTC Secretariat stated that there have been issues with the format of observer data received in the past which may explain why some information on cetaceans has not been included in the same way that is has been for other species of bycatch and highlighted the need to work directly with organisations coordinating observer programmes to rectify these issues.

It was noted that while purse seine bycatch and interactions is an important issue which could benefit from additional work, the available scientific evidence identifies cetacean bycatch in tuna gillnets as a much more significant conservation issue. Therefore, the IWC's BMI is prioritising its work on bycatch in gillnets rather than purse seine fleets. The IWC suggested that it could be helpful for other organisations to take a lead on further investigations of the purse seine fleet including compiling historical information on its bycatch. If purse seine bycatch is revealed to be a very significant cetacean conservation issue then the BMI would be very willing to prioritise activities on this gear also.

3.1.3 Gillnets

The issue of cetacean bycatch in gillnets was then discussed, focusing on research examining bycatch and fishing effort data. Participants noted that there is a significant tuna gillnet fleet operating in the region, including a large proportion of artisanal vessels and semi-industrial vessels that switch gears (e.g. gillnets to longlines etc), or are registered in two countries; and which also spend weeks at sea with no observers onboard and bycaught species are not landed. This signifies extensive fishing effort and potentially further complicates the reporting of bycatch and effort. The group noted that the weaknesses identified below in relation to *Resolution 13/04* were particularly relevant here, due to the number of smaller vessels operating with gillnets.

The IOTC holds some information on the fleet and effort, for certain size classes, however much information is lacking. The number of boats per country is available only over a certain (larger) size class and where fishing effort is recorded and reported (as number of trips and days at sea), this format of reporting makes it very difficult to use effort data to assess bycatch.

The group agreed that an important activity would be the quantification of the tuna gillnet fleet, by size class and country, as this would provide baseline information which could be used in a coarse assessment of gillnet fishing activity.

The group noted that some IOTC countries, such as Iran have very sizable gillnet fleets, and that these vessels operate in the ABNJ and in neighbouring countries' waters. They are also known to switch gears and many have onboard freezers and the capacity to operate on the high seas for more than two months per trip. There is potentially a huge amount of information missing from these vessels that needs to be captured. The IOTC Secretariat reported that Iranian scientists were invited to this meeting but were unable to attend. However, work is being undertaken collaboratively in relation to understanding gillnet fishing activity by the Iranian fleet.

3.1.4 Gaps in cetacean distribution and abundance

The group noted that there are considerable gaps in relation to knowledge of cetacean population abundance and distribution within the Indian Ocean region, which provides challenges in understanding the scale and possible population-level impacts of bycatch. The IWC discussed this gap in information during its recent Scientific Committee meeting, and the 2019 IWC-BMI Indian Ocean workshop recommended that governments and other relevant stakeholders in the Indian Ocean region carry out cetacean sampling surveys to collect information on species abundance and distribution at national and regional scales. Sharing this information with the IWC Scientific Committee was encouraged. Surveys would be particularly valuable in areas where previous studies have yielded relative abundance measures against which current data could be compared in order to detect possible trends or shifts in distribution of cetacean populations.

3.2 Reporting requirements

It was suggested that some of the issues with lack of reporting of interactions may stem from the vague wording of some of the IOTC Resolutions relevant to marine mammals. For *Resolution 13/04 On the conservation of cetaceans* paragraph 9 states:

> *"For CPCs having national and state legislation for protecting these species shall be exempt from reporting to IOTC, but are encouraged to provide data for the IOTC Scientific Committee consideration. The IOTC Scientific Committee will analyse the situation concerning the availability of data and will advise the Commission to undertake support measures to developing CPCs to overcome this situation."*

The Resolution also states:

> *"This measure shall apply to all fishing vessels flying the flag of a CPC and on the IOTC Record of Fishing Vessels or authorised to fish tuna and tuna-like species managed by the IOTC on the high seas. The provisions of this measure do not apply to artisanal fisheries operating exclusively in their respective EEZ."*

Some data are thought to be collected regardless of where the vessels operate but they are not submitted to the Secretariat. It was suggested that this Resolution should be strengthened to require a more comprehensive submission of data on marine mammals to ensure that data are reported regardless of whether national or state legislation are in place and that data are reported for artisanal as well as industrial fisheries. The group recommended a revision of this Resolution to be discussed at the WPEB, noting that this would also need the approval of the Working Party on Data Collection and Statistics (WPDCS).

Furthermore it was also noted that several Resolutions only apply to vessels over 24m in length and for vessels of any length operating outside of their CPC's EEZ, including the following which are of particular relevance to marine mammals: *Resolution 15/01 On the recording of catch and effort data by fishing vessels in the IOTC area of competence* and *11/04 On a regional observer scheme*. With these provisions in place, there is potentially a significant amount of data not being reported from these fleets which would be very valuable for scientific research as well as design of possible monitoring and management measures.

The group agreed that the collation of available datasets is a priority for future work and highlighted that relevant Resolutions (in particular 13/04) should be discussed at WPEB to amend this to make it less prescriptive in terms of data reporting regardless of the region (EEZ or not) or the vessel size.

4 Current bycatch management and mitigation

4.1 IOTC existing measures relevant to cetaceans

Current management measures in the form of formal IOTC Resolutions were discussed. As mentioned above there is only one Resolution dating back to 2013 which specifically relates to cetaceans (*13/04*). As previously discussed, this Resolution is problematic as it is vague in what data are requested or required and from which fishing fleets and it gives exemptions for countries with national legislation in place.

There are other Resolutions which are also relevant to cetacean bycatch including those on data reporting (in particular *Resolution 15/01* and *11/04* which call for interactions with cetaceans to be reported) and those relating to gear configurations which may act as mitigation measures for cetacean bycatch. Those discussed relating to gear configurations included the following:

- *Resolution 19/01 On an interim plan for rebuilding the Indian Ocean Yellowfin tuna stock in the IOTC area of competence* which encourages the phasing out of gillnets and the setting of gillnets at 2m depth from the surface to mitigate the ecological effects of gillnets as well as an increase in observer coverage onboard gillnet vessels.
- *Resolution 19/02 Procedures on a Fish Aggregating Devices (FADs) management plan* requires vessels to only use non-entangling FADs which would help to reduce entanglements of cetaceans but this applies only to purse seine vessels fishing on schools associated with FADs.
- *Resolution 17/07 On the prohibition to use large-scale driftnets in the IOTC area* which prohibits the use of large-scale driftnets which only applies to vessels operating in the high seas until 2022 when it should be applied to all vessels operating in the entire IOTC area of competence.

In relation to *Resolution 19/01* it was noted that this Resolution is not binding so will be less likely to be fully implemented and only applies to larger vessels (over 24m) or those fishing outside of their EEZ so will not impact a large part of the fleet. The Resolution is also part of rebuilding efforts for Yellowfin tuna stocks so is less relevant to cetaceans.

The group noted in relation to *Resolution 17/07* that the use of driftnets within EEZs longer than 2.5km is still an issue and that many vessels would not be able to viably operate using nets of shorter lengths (as they will be required to from 2022 under *Resolution 17/07*) and so it may take some time for these gears to be replaced or the vessels to be reconfigured for other gears. Furthermore, again the Resolution (currently) only applies to vessels operating on the high seas and suggestions were made that it should be extended to include vessels operating within EEZs. The ambiguity of such Resolutions and consequently the different ways in which they are interpreted by CPCs makes it very difficult for the IOTC Secretariat to carry out its mandate.

In relation to gillnets it was highlighted that data need to be reported for smaller vessels and the artisanal fleet and that data need to be reported on the different gear configurations of gillnets onboard all vessels. Currently the unit of measurement for gillnet fishing effort is number of trips and days at sea which is not sufficient for any detailed analysis. Therefore, the meeting participants

suggested that the reporting unit should be changed to km net/hours. The IOTC Secretariat noted that the WPEB and other Working Parties can only provide recommendations on how Resolutions could be amended based on science so further information would be required to support this recommendation.

It was also noted that the IOTC Secretariat currently holds a list of vessels over a certain size only and with the growing number of gillnet vessels, it would be useful to have a record of all vessels engaged in commercial fisheries within the IOTC region, regardless of their size. It was noted that it would be useful to know more about what proportion of target catch was coming from vessels operating on the high seas compared with fishing within EEZs as well as the size of these vessels. In many countries a national fleet management unit includes many vessels both over and under 24m in length, operating both inside and outside the EEZ with catch reporting covering all of these vessels. In relation to gillnets the group further suggested that data reporting requirements should include the different gear configurations of gillnets (e.g. surface or sub-surface setting, and depth of setting). The meeting participants suggested a change to how such information is reported to the Secretariat would be useful. This could be suggested as a recommendation to be raised by WPEB to be approved by WPDCS and the SC.

4.2 Relevant bycatch mitigation research and FAO Technical Guidelines

4.2.1 Sub-surface setting of gear

WWF-Pakistan and collaborating scientists presented information about their project with gillnet fishers in Pakistan conducting trials of sub-surface setting of nets.

WWF-Pakistan began their crew-based observer scheme on Pakistani gillnet vessels in 2012, and quickly realised that very high cetacean mortality in gillnets was occurring and that there were no quick and easy solutions. From 2016 onward fishermen seeking to increase yellowfin and skipjack tuna catches used sub-surface setting of their gear which was around 1-2 m deep in some places. This technique has ultimately also provided the best solution for catching larger, higher value tuna whilst reducing cetacean bycatch. During 2020, fishers have reported that there has not been a single cetacean bycatch event from the vessels using sub-surface setting.

However, larger vessels (e.g. those taller, larger vessels with refrigeration capabilities) have had difficulty with sub-surface sets, as the height of the deck made it more challenging to deploy the net, as it is more likely to become entangled during setting. This has not been the case for smaller vessels.

Recent analysis of the WWF-Pakistan data (under review), completed by scientists from Florida International University, examined 3400 sets (~1700 experimental and 1600 control) over five years of data collection. The results show a large reduction of cetacean bycatch with sub-surface setting of gear with a relatively small (<10%) reduction in target species Catch Per Unit of Effort. This research suggests that thousands fewer animals could be bycaught if the entire Pakistani gillnet fleet were to use sub-surface setting of gillnet gear.

The group noted the promising results arising from the WWF-Pakistan experiments. It was noted that there were some issues relating to the experimental design during data collection. A lack of clear temporal overlap between the setting of subsurface gears and the control (surface set) gears leaves open the possibility that other external factors contributed to the differences in bycatch, however the lead researcher (Kiszka) noted that the two-year difference in temporal overlap was unlikely to be affected by either a change in dolphin distribution or abundance. The group agreed that improvements to the experimental design and a 'scale up' of the trials to other countries would be extremely useful. It was noted that that this research could be highly appropriate for the Common

Oceans Areas Beyond National Jurisdiction (ABNJ) Tuna project Phase 2 and the group suggested that this may be an area in which the IOTC could support IWC and WWF- Pakistan in collaboration.

It was noted that even a relatively small reduction in target catch, as found in this research, could be very significant to fishers, especially for those running at low profit margins. The group agreed that there was also a need for interdisciplinary work looking at socio-economics in addition to biological and operational aspects of mitigation trials. WWF Pakistan noted that while there had been a reduction in target catch, the species and specimens caught in sub-surface nets were generally of higher value and/or larger size classes so this would have less of an economic effect than if the catch composition had remained the same

WWF Pakistan also noted that a lot of Iranian vessels had been changing their gear configuration to subsurface setting as there is a lot of interaction between Pakistani and Iranian vessels and their crew.

4.2.2 Pingers, low-tech/low-cost alarms, LED Lights

The group heard from BMI Expert Panel members on recent developments on low-tech and low-cost mitigation measures. In many parts of the world fishers may not be able to afford mitigation measures, such as acoustic alarms. There is therefore a need for research into low-cost and low-tech methods, which may reduce bycatch. Recent trials led by researchers from the University of Newcastle (UK) in Peru tested glass bottles containing a metal bolt (which emit a similar acoustic profile to 'pinger' acoustic alarms) to try to reduce cetacean bycatch. The analysis of the available data suggests that this experimental measure has not reduced bycatch. Further trials are planned in Peru and Brazil to test plastic bottles with trapped air, which is thought to have high reflectance for echolocating dolphins.

LED lights are another mitigation measure currently being trialled in gillnets, with research recently published from trials in small-scale gillnet fisheries in Peru (Bielli et al. 2020) showing a reduction in small cetacean bycatch of 70%. The meeting noted that it was important to ensure that mitigation measures introduced to reduce bycatch of one taxonomic group did not increase bycatch of another.

4.2.3 Gear switching

The group briefly discussed gear switching (from gillnets to alternative gears such as longlines or handlines). A recently published paper by Berninsone et al. (2020) reporting on fishers in Argentina who switched from using gillnets to bottom-set longlines was suggested as having an interesting approach and a good experimental design for robustly testing bycatch reduction. However, this specific switch from gillnets to bottom-set longlines was not discussed in relation to Indian Ocean fisheries.

In relation to gear switching possibilities for countries such as Iran with large gillnet fleets, it was noted that their tuna fishery consists of small-scale handline fisheries in the coastal areas and a very small longline fishery in coastal areas, and that some small-scale gillnet fishers also recently tried purse seining, without good results. For the larger gillnet vessels (~27m) their configuration is not suitable for purse seine. This is a serious issue because most of these vessels are operating in waters off Somalia and other countries, which is considered IUU fishing.

4.2.4 FAO Technical Guidelines

The group noted that the FAO is currently finalizing Technical Guidelines for reducing and preventing marine mammal bycatch in capture fisheries. This document, which was drafted with extensive consultation with the IWC BMI and its Expert Panel members, is awaiting publication but will be available soon. The guidelines will be useful in guiding mitigation and prevention and to underpin training and other capacity building activities.

5 IWC Bycatch Mitigation Initiative Pilot Projects and Capacity Building

The IWC Secretariat presented a brief overview of the BMI's planned pilot projects and capacity building in order to discuss how these initiatives could assist IOTC Contracting Parties or be part of a collaborative work programme on cetacean bycatch.

5.1 BMI Pilot projects

The BMI is currently working with a number of prioritised countries to develop locally-led pilot projects where multi-disciplinary approaches to bycatch reduction will be implemented. National governments, fishing communities, local experts and conservationists are being brought together to define the scope of each project, which could include a combination of bycatch risk assessment, bycatch monitoring, technical mitigation, incentivisation through social and economic approaches, and changes to fishing practices (gear switching etc.) or exploration of alternative livelihoods. The purpose of the pilot projects is to work holistically and collaboratively towards solutions, with the ultimate goal that effective approaches can be scaled up to other fisheries within the country and exported to other fisheries and countries.

Within the Indian Ocean, the countries which have been prioritised include Kenya, India and Pakistan. Ideally at least one of the projects in these countries would include a focus on tuna gillnet fisheries, however this is still to be determined. The BMI has chosen countries through a process of expert review, using information on cetacean bycatch and gillnet fisheries from a variety of sources (IWC Scientific Committee reports, peer-reviewed papers, information reported through the US MMPA, expert opinion etc). Countries were then assessed for feasibility as to whether it would be possible to implement a project. For the Indian Ocean, the BMI's workshop in 2019 helped identify the most suitable countries for pilot project development.

In addition to India, Pakistan and Kenya, countries that will host BMI Pilot Projects include, Peru, Indonesia/Malaysia (Borneo), Republic of Congo and Thailand.

5.2 Bycatch capacity building programme

In relation to the BMI capacity building programme, there are a wide range of training activities that the BMI can implement to assist countries (IWC and non-IWC contracting governments), including:

- Rapid bycatch risk assessment
- Cetacean abundance and trends estimates, cetacean distribution survey methodology
- Bycatch monitoring (e.g. observer schemes, including crew-based and technological monitoring, experimental design, species identification)
- Mitigation measures and management measures
- incentive based programs and fisher engagement

The IWC also has a capacity building programme through its large whale entanglement initiative, which trains specialised 'responders' to whale entanglement events. It is set up with the same structure as the IWC BMI, in that there is a coordinator and an Expert Panel made up of most of the

heads of response networks from countries with longstanding programs, as well as internationally recognized veterinarians with expertise on this topic. The Expert Panel has developed consensus "best practices" and a training strategy and curriculum, which have been endorsed by the IWC Commission (89 countries).

Since capacity building began in 2012, the program has trained approximately 1,500 participants from 34 countries. Most of these trainings have helped to establish coastal teams for National responses. Only one training session so far was aimed at response in international waters. Many trainings have been conducted in cooperation with other IGOs or regional agreements (e.g. UNEP-CEP, SPREP, CPPS, etc.). All trainings are conducted with the approval, cooperation or active request of the host country. In the Indian Ocean there are two urgent reasons to consider training or guidance for tuna fishers. Firstly, the Arabian Sea humpback whale population is endangered and there is evidence that entanglements are occurring, and secondly, current release practices are endangering the lives of fishers. If it were helpful, the IWC EP could provide some simple guidance for pelagic fishers who find a large whale in their nets (or longlines).

The group noted that there are many opportunities on capacity building to join efforts, including with the FAO on capacity building relating to the Technical Guidelines and with the Common Oceans ABNJ Tuna Phase 2 project, which remains very interested in including this in the project. The group also noted that trialling sub-surface setting of gillnet gear across a number of Indian Ocean countries, using an improved experimental design, would also be of interest to the Common Oceans project. It was noted that the ABNJ project is only likely to commence in 2022, so this is not an option for immediate collaborative work.

The group also agreed that training on cetacean dis-entanglement, particularly large whale dis-entanglement is a pressing issue for the region and for ensuring safety at sea for fishers. It was suggested that any future collaborative capacity building programme should include guidance, or training for safe handling and release practices, drawing from the lessons that have been learned through the extensive experience of the IWC Entanglement response programme, as well as the newly published CMS Guidelines for Safe Handling and Release of Small Cetaceans, which were extensively reviewed by experts consulted by both the IWC and CMS. Both of these platforms prioritise fishing crew safety and discourage any practices that put fishers at unnecessary risk (e.g. through entering the water with entangled animals).

6 Potential collaborative work programme

A range of potential collaborative actions between the IOTC, IWC and other organisations and experts were discussed by the group, and included:

6.1 Fisheries and bycatch data synthesis and gap analysis (ecological/biological, fishing effort, vessel classification, economic data)

The paucity of data on cetacean bycatch and cetacean interactions with all relevant fishing gears was highlighted as a major challenge to effective management of cetaceans. Furthermore, the paucity of information held by the IOTC in relation to artisanal and small-scale tuna fisheries using gillnets (fleet characteristics, effort) is a particular challenge in understanding the potential bycatch risk to cetaceans and providing baseline information for future management measures. As such a scoping study for a gap analysis was suggested as a priority piece of work, which would include researching, by country, the artisanal and small-scale fleet characteristics in more detail, including economic information about the fisheries (turnover per vessel, likely margins etc.), and compiling existing data on cetacean bycatch in peer-reviewed and grey literature and other sources.

The possibilities of doing this work as part of a workshop with CPCs bringing data was discussed but the IOTC Secretariat noted that they have attempted such workshops in the past and have not found them to be very productive. It was noted that a significant amount of preparatory work would be needed for a fully comprehensive output, and so it was suggested that a consultant should be contracted to complete this work.

WWF Pakistan have developed a set of Terms of Reference for a project to review bycatch of all species in the Indian Ocean. This ToR document provides a useful starting point for discussions around what exactly should be done by a consultant. It was noted that it would be useful to have an idea of the utility of certain types of data as well as what information could be useful in the future, both of which could form a part of this contracted project.

6.2 Risk assessments

The possibility of conducting Ecological Risk Assessments for cetaceans was discussed. This technique has been used in the past by the IOTC for other taxa including sharks and turtles and it was thought to be a useful first step. However, there are some drawbacks in that it is not a quantitative process so there are limitations on its utility and the group noted the importance of ensuring that the data are robust enough so that species which rarely overlap with fisheries are not incorrectly prioritised.

It was suggested that this could be a further piece of work that could be undertaken in a collaboration between IWC and IOTC and brought to the WPEB for endorsement. This would use the existing available data and would be conducted in parallel to the contracted consultant carrying out the data gap analysis. It was noted that the IWC could help with risk assessments by collating relevant information available for cetaceans.

6.3 Mitigation measure trials/implementation

Further trials to determine the efficacy of subsurface gillnet setting in reducing bycatch without negatively impacting target catch value were encouraged and it was suggested that these types of experiments would likely be encouraged by the ABNJ tuna Phase 2, including through collaborative efforts with the IOTC, IWC and WWF-Pakistan and other experts

Further trials of other measures including low-cost, low-tech techniques discussed should also be continued as part of the IWC Bycatch Mitigation Initiative.

The group recommended that the IOTC explore collaboration with IWC and the relevant Contracting Parties on the pilot projects in relation to trialling mitigation measures.

There was some discussion around the work that members of the group are doing on training fishers in safe techniques for fishers to disentangle cetaceans and suggested that this work could be rolled out across the region. It was recommended that IOTC and IWC work together to find a way to deliver training on entanglement response practices that prioritise the safety of fishers as well as entangled animals.

6.4 Other opportunities for collaboration between IOTC and IWC

As described above in section 3.1 it was suggested that fisheries independent surveys would be a useful source of data for assessing the population status of cetaceans, which is needed to effectively evaluate the impacts of bycatch on affected populations. Repeat surveys on populations for which

relative abundance estimates are available from the 1990s could provide insight into possible trends. The IOTC stated that this would fall outside of the remit of the Secretariat so could not form part of collaborative work with IWC, but that this is something that the BMI is interested in exploring further.

7 Next steps

A draft version of this report was presented to the IOTC 16th WPEB meeting for information purposes. The discussions during the 16th WPEB will be taken into account in considering the next steps for collaboration. The meeting recommended to the WPEB the following which will be highlighted by WPEB chair at the IOTC SC:

- That the IOTC and the IWC commit to working more closely on the issue of cetacean bycatch in Indian Ocean tuna fisheries, including through assessing information gaps, assessing risk, the BMI's pilot projects, and capacity building opportunities (such as the FAO Technical Guidelines and the Common Oceans ABNJ Phase 2 development).
- That the IOTC and IWC build on existing proposals for data synthesis and gap analyses (e.g. ToR developed by WWF Pakistan) and develop a contract for a consultant to collate all available information on national tuna fishing fleets (particularly small-scale and artisanal gillnet vessels) and historical data on cetacean bycatch for different fishing gears, and reach out to researchers who may have these data, collate all information and provide an estimate of bycatch across the region classified by fisheries.
- That the IOTC, in collaboration with the IWC and other experts, evaluate (via the consultant's report) the available existing data relating to cetacean distribution and abundance, cetacean bycatch, fleet composition and effort and suggest what information is useful or not, what gaps exist and what additional information could be collected.
- That the IOTC review the data collection component of Resolution 13/04 with a view to strengthening this in relation to the issues raised during the meeting
- That that IOTC, in collaboration with the IWC and other experts, conduct an Ecological Risk Assessment for cetaceans using currently available information (in advance, or in parallel to the work on data synthesis/data gap analysis)
- That a follow-up (virtual) meeting be held in collaboration with the IWC prior to the next IOTC Scientific Committee meeting to further develop and refine the collaborative activities and the requests to the Committee from this group.
- That the IOTC and IWC and others (including relevant national governments and WWF) discuss joint activities as part of the cetacean bycatch component being proposed to the Common Oceans ABNJ Tuna Phase 2 Project development team.

Annex I – List of Participants

- Dr Sylvain Bonhommeau - Ifremer, Chair of IOTC Working Party on Ecosystem and Bycatch
- Lauren Nelson - Fisheries Science Officer for IOTC Secretariat
- Dr Paul DeBruyn - Science Manager for IOTC Secretariat
- Fabio Fiorellato – Data coordinator for IOTC Secretariat
- Marguerite Tarzia - Bycatch coordinator for IWC Secretariat
- Dr Rebecca Lent - IWC Executive Secretary
- Dr Cherry Allison - Head of Statistics, IWC Secretariat
- David Mattila - IWC Human Impact Reductions Officer, GWERN coordinator
- Sarah Smith - Head of programme development, IWC Secretariat
- Dr Rob Enever – Conservation engineer at FishTek Marine; IWC Expert Panel on Bycatch member
- Brianna Elliot – Ph.D. Student at Duke University
- Dr Charles Anderson – Independent Biologist, Maldives
- Jose Carlos Baez - Researcher at Instituto Espanol de Oceanografia
- Umair Shahid – Indian Ocean Tuna manager for WWF Mozambique; IWC Expert Panel on Bycatch member
- Evgeny Romanov – Fisheries Research and Development at IRD
- Dr Gianna Minton – Coordinating Arabian Sea Whale Network
- Philippe Sabarros– researcher at IRD
- Martha Gonzalez – manages observer databases for tropical tuna Spanish fleet
- Dr Per Berggren – professor at Newcastle University, UK; IWC Expert Panel on Bycatch member
- Dr Pingguo He – invited by FAO, currently working at University of Mass Dartmouth
- Pascal Bach – based in Sete, overseeing the monitoring of French Tropical tunas for IRD
- Jerry Scott – IWC Expert Panel on Bycatch member; assisting/advising FAO on the next phase of ABNJ tuna
- Dr Jeremy Kiszka – Florida International University, research on Indian Ocean cetaceans and bycatch since 2003, collaborating with WWF Pakistan; IWC Expert Panel on Bycatch member;
- Moazzam Khan – technical advisor to WWF Pakistan
- Miguel Herrera – working for producers' organization from Spain (OPAGAC) who operate purse seiners in the Atlantic and Indian Oceans. Was involved in work with IOTC as data coordinator for 15 years at Secretariat and also involved in work with bycatch estimates of marine mammals
- Jon Ruiz – data collection and observer programs from purse seine fleet in IO for AZTI
- Elizabeth Mueni – Kenya Fisheries Service, in charge of data management, bycatch mitigation; IWC Expert Panel on Bycatch member

Annex II - References

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