

## OUTCOMES OF THE 17<sup>th</sup> SESSION OF THE SCIENTIFIC COMMITTEE

PREPARED BY: IOTC SECRETARIAT<sup>1</sup>, 8 APRIL 2015

### PURPOSE

To inform participants at the 11<sup>th</sup> Working Party on Ecosystems and Bycatch (WPEB11) of the recommendations arising from the 17<sup>th</sup> Session of the Scientific Committee (SC17) held from 8–12 December 2014, specifically relating to the work of the WPEB.

### BACKGROUND

At the 17<sup>th</sup> Session of the SC, the SC noted and considered the recommendations made by the WPEB in 2014 that included requests to address the deficiencies in data collection, monitoring and reporting by CPCs, as well as to carry out targeted research and analysis on the most commonly caught elasmobranch species.

List of the most commonly caught elasmobranch species

Common name	Species	Code
Manta and devil rays	Mobulidae	MAN
Whale shark	<i>Rhincodon typus</i>	RHN
Thresher sharks	<i>Alopias spp.</i>	THR
Mako sharks	<i>Isurus spp.</i>	MAK
Silky shark	<i>Carcharhinus falciformis</i>	FAL
Oceanic whitetip shark	<i>Carcharhinus longimanus</i>	OCS
Blue shark	<i>Prionace glauca</i>	BSH
Hammerhead shark	Sphyrnidae	SPY
Other Sharks and rays	–	SKH

The recommendations on the deficiencies in data collection, monitoring and reporting by CPCs in relation to bycatch species will be discussed in paper IOTC–2015–WPEB11–07 and are therefore not presented in this paper.

Based on the recommendations arising from the WPEB10, the SC17 adopted a set of recommendations, provide at [Appendix A](#) of this paper.

The recommendations contained in [Appendix A](#) were provided to the Commission for consideration at its 19<sup>th</sup> Session held in April/May 2015. A separate paper, IOTC–2015–WPEB11–04 addresses the responses and actions of the Commission.

In addition, the SC17 reviewed and endorsed a Program of Work for the WPEB, including a revised assessment schedule, as detailed in [Appendix B](#) and [Appendix C](#) respectively. A separate paper (IOTC–2015–WPEB11–10) will outline the review and development process for a *Program of Work* for the WPEB for the next five years.

### DISCUSSION

In addition to the recommendations outlined in [Appendix A](#), [Appendix B](#) and [Appendix C](#), the following extracts from the SC17 Report (IOTC–2014–SC17–R) are provided here for the consideration and action of the WPEB11:

#### *Assessing the need for an NPOA*

(Para. 64) The SC **NOTED** the difficulties faced by the IOTC Secretariat when summarising and standardising information on reported seabird and marine turtle interactions across all CPCs given the number of sources and range in type of information reported. Given the increasing amount of information being reported, the SC therefore **REQUESTED** the WPEB discuss and develop new ideas to update and improve how these data are presented and summarised in the future.

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*IOTC NPOA portal*

(Para. 66) The SC **REQUESTED** that all CPCs without an NPOA-Sharks and/or NPOA-Seabirds expedite the development and implementation of a NPOA, and to report progress to the WPEB and SC in 2015, **NOTING** that NPOAs are a framework that should facilitate estimation of shark catches, seabird interactions, and development and implementation of appropriate management measures, which should also enhance the collection of bycatch data and compliance with IOTC Resolutions.

*IOTC species identification cards: Marine turtles, seabirds and sharks*

(Para. 131) The SC **REQUESTED** that the IOTC Secretariat facilitate the translation of the identification cards for marine turtles, seabirds and sharks into the following languages, in priority order: Farsi, Arabic, Spanish, Portuguese and Bahasa-Indonesian, and that the Commission allocate funds for this purpose.

*Executive summaries for marine turtles, seabirds and shark species*

The SC also adopted revised Executive Summaries for bycatch and other species that can be found as appendices to the SC16 report, and which can be downloaded from the IOTC website's new **Stock Status Dashboard**, in English and French:

English: <http://iotc.org/science/status-summary-species-tuna-and-tuna-species-under-iotc-mandate-well-other-species-impacted-iotc>

French: <http://iotc.org/fr/science/r%C3%A9sum%C3%A9-de-l%C3%A9tat-des-stocks>

**RECOMMENDATION**

That the WPEB:

- 1) **NOTE** paper IOTC–2015–WPEB11–03 which outlined the main outcomes of the 17<sup>th</sup> Session of the Scientific Committee, specifically related to the work of the WPEB.
- 2) **CONSIDER** how best to progress these issues at the present meeting.

**APPENDICES**

**Appendix A:** Consolidated set of recommendations of the 17<sup>th</sup> Session of the Scientific Committee (8–12 December 2014) to the Commission, relevant to the Working Party on Ecosystems and Bycatch.

**Appendix B:** Program of Work (2015–2019) for the IOTC Working Party on Ecosystems and Bycatch (WPEB).

**Appendix C:** Schedule of stock assessment for the WPEB (2015–2019).

## APPENDIX A

**CONSOLIDATED SET OF RECOMMENDATIONS OF THE 17<sup>th</sup> SESSION OF THE SCIENTIFIC COMMITTEE (8–12 DECEMBER 2014) TO THE COMMISSION RELEVANT TO THE WORKING PARTY ON ECOSYSTEMS AND BYCATCH**

*Extract of the Report of the 17<sup>th</sup> Session of the Scientific Committee*

*(IOTC–2014–SC17–R; Appendix XLIII, PAGES 347–357)*

**STATUS OF MARINE TURTLES, SEABIRDS AND SHARKS IN THE INDIAN OCEAN**

*Status of Marine Turtles, Seabirds and Sharks in the Indian Ocean*

**Sharks**

- SC17.04 ([para. 149](#)) The SC **RECOMMENDED** that the Commission note the management advice developed for a subset of shark species commonly caught in IOTC fisheries for tuna and tuna-like species:
- Blue shark (*Prionace glauca*) – [Appendix XXVII](#)
  - Oceanic whitetip shark (*Carcharhinus longimanus*) – [Appendix XXVIII](#)
  - Scalloped hammerhead shark (*Sphyrna lewini*) – [Appendix XXIX](#)
  - Shortfin mako shark (*Isurus oxyrinchus*) – [Appendix XXX](#)
  - Silky shark (*Carcharhinus falciformis*) – [Appendix XXXI](#)
  - Bigeye thresher shark (*Alopias superciliosus*) – [Appendix XXXII](#)
  - Pelagic thresher shark (*Alopias pelagicus*) – [Appendix XXXIII](#)

**Marine turtles**

- SC17.05 ([para. 150](#)) The SC **RECOMMENDED** that the Commission note the management advice developed for marine turtles, as provided in the Executive Summary encompassing all six species found in the Indian Ocean:
- Marine turtles – [Appendix XXXIV](#)

**Seabirds**

- SC17.06 ([para. 151](#)) The SC **RECOMMENDED** that the Commission note the management advice developed for seabirds, as provided in the Executive Summary encompassing all species commonly interacting with IOTC fisheries for tuna and tuna-like species:
- Seabirds – [Appendix XXXV](#)

**GENERAL RECOMMENDATIONS TO THE COMMISSION, TO SPECIFIC CPCs AND/OR OTHER BODIES**

*Report of the 10<sup>th</sup> Session of the Working Party on Ecosystems and Bycatch (WPEB10)*

*Evaluating benefits of retaining non-target species*

- SC17.10 ([para. 41](#)) **NOTING** the lack of expertise and resources within the WPEB and the short timeframe to fulfill this task, the SC **RECOMMENDED** that a consultant be hired to conduct this work and present the results at the next WPEB meeting. The following tasks, necessary to address this issue, should be considered for the terms of reference, taking into account all species that are usually discarded on all major gears (i.e., purse seines, longlines and gillnets), and fisheries that take place on the high seas and in coastal countries EEZs:
- i) Estimate species-specific quantities of discards to assess the importance and potential of this new product supply, integrating data available at the IOTC Secretariat from the regional observer schemes;
  - ii) Assess the species-specific percentage of discards that is captured dead versus alive, as well as the post-release mortality of species that are discarded alive, in order to estimate what will be the added fishing mortality to the populations, based on the best current information;
  - iii) Assess the feasibility of full retention, taking into account the specificities of the fleets that operate with different gears and their fishing practices (e.g., transshipment, onboard storage capacity);
  - iv) Assess the capacity of the landing port facilities to handle and process this catch;
  - v) Assess the socio-economic impacts of retaining non-target species, including the feasibility to market those species that are usually not retained by those gears;

- vi) Assess the benefits in terms of improving the catch statistics through port-sampling programs;
- vii) Evaluate the impacts of full retention on the conditions of work and data quality collected by onboard scientific observers, making sure that there is a strict distinction between scientific observer tasks and compliance issues.

***Sharks and rays: Review of data needs and way forward for the evaluation of shark stocks - catch data reconstruction***

SC17.11 (para. 43) The SC **RECOMMENDED** that a short inter-sessional meeting is conducted with a small group of scientists to work mainly on blue shark catch data reconstruction to be used for stock assessment in 2015. Ideally, and to reduce costs, all participants should fund their own participation at a venue to be decided, or work electronically.

***Review of new information on the status of sharks and rays***

SC17.12 (para. 44) **NOTING** that the information on retained catches and discards of sharks contained in the IOTC database remains very incomplete for most fleets despite their mandatory reporting status, and that catch-and-effort as well as size data are essential to assess the status of shark stocks, the SC **RECOMMENDED** that all CPCs collect and report catches of sharks (including historical data), catch-and-effort and length frequency data on sharks, as per IOTC Resolutions, so that more detailed analysis can be undertaken for the next WPEB meeting.

***Shark Ecological Risk Assessment: review of current knowledge and potential management implications***

SC17.13 (para. 45) The SC reiterated its **RECOMMENDATION** from 2013, that the Commission note the list of the 10 most vulnerable shark species to longline gear (Table 3) and purse seine gear (Table 4) in the Indian Ocean, as determined by a productivity susceptibility analysis, compared to the list of shark species/groups required to be recorded for each gear, contained in Resolution 13/03 *on the recording of catch and effort by fishing vessels in the IOTC area of competence*. At the next revision to Resolution 13/03, the Commission may wish to add the missing species/groups of sharks and rays.

SC17.14 (para. 46) The SC reiterated its **RECOMMENDATION** from 2013, that, in line with Recommendation 12/15 on the best available science, the list of shark species (or groups of species) for longline gear under Resolution 13/03 (Table 3) should be supplemented with the silky shark (*Carcharhinus falciformis*), which was estimated to be at risk in longline fisheries by the ERA conducted in 2012 (ranked as the 4<sup>th</sup> most vulnerable species to longline gear). The SC **REQUESTED** the Commission to define the most appropriate means of collecting this additional information.

**TABLE 3.** List of the 10 most vulnerable shark species to longline gear compared to the list of shark species/groups required to be recorded in logbooks, as listed in Resolution 13/03 *on the recording of catch and effort by fishing vessels in the IOTC area of competence*.

PSA vulnerability ranking	Most susceptible shark species to longline gear	FAO Code	Shark species currently listed in IOTC Resolution 13/03 for longline gear: mandatory recording	FAO Code
1	Shortfin mako ( <i>Isurus oxyrinchus</i> )	SMA	Blue shark ( <i>Prionace glauca</i> )	BSH
2	Bigeye thresher ( <i>Alopias superciliosus</i> )	BTH	Mako sharks ( <i>Isurus</i> spp.)	MAK
3	Pelagic thresher ( <i>Alopias pelagicus</i> )	PTH	Porbeagle shark ( <i>Lamna nasus</i> )	POR
4	Silky shark ( <i>Carcharhinus falciformis</i> )	FAL	Hammerhead sharks ( <i>Sphyrna</i> spp.)	SPN
5	Oceanic whitetip shark ( <i>Carcharhinus longimanus</i> )	OCS	Other sharks	SKH
6	Smooth hammerhead ( <i>Sphyrna zygaena</i> )	SPZ	Thresher sharks ( <i>Alopias</i> spp.)	THR
7	Porbeagle ( <i>Lamna nasus</i> )	POR	Oceanic whitetip shark ( <i>Carcharhinus longimanus</i> )	OCS
8	Longfin mako ( <i>Isurus paucus</i> )	LMA		
9	Great hammerhead ( <i>Sphyrna mokarran</i> )	SPM		
10	Blue shark ( <i>Prionace glauca</i> )	BSH		

SC17.15 (para. 47) The SC reiterated its **RECOMMENDATION** from 2013, that, in line with Recommendation 12/15 on the best available science, the list of shark species (or groups of species) for purse seine gear under Resolution 13/03 (Table 4) should be supplemented with the silky shark (*Carcharhinus falciformis*), mako sharks (*Isurus* spp.), hammerhead sharks (*Sphyrna* spp.), pelagic stingray (*Pteroplatytrygon violacea*), dusky shark (*Carcharhinus obscurus*), tiger shark (*Galeocerdo cuvier*), which were estimated to be at risk in purse seine fisheries by the ERA conducted in 2012. The SC **REQUESTED** the Commission to define the most appropriate means of collecting this additional information.

**TABLE 4.** List of the 10 most vulnerable shark species to purse seine gear compared to the list of

shark species/groups required to be recorded in logbooks, as listed in Resolution 13/03 *on the recording of catch and effort by fishing vessels in the IOTC area of competence.*

PSA vulnerability ranking	Most susceptible shark species to purse seine gear	FAO Code	Shark species listed in IOTC Resolution 13/03 for purse seine gear: Mandatory recording	FAO Code
1	Oceanic whitetip shark ( <i>Carcharhinus longimanus</i> )	OCS	Whale sharks ( <i>Rhincodon typus</i> )	RHN
2	Silky shark ( <i>Carcharhinus falciformis</i> )	FAL	Thresher sharks ( <i>Alopias</i> spp.)	THR
3	Shortfin mako ( <i>Isurus oxyrinchus</i> )	SMA	Oceanic whitetip shark ( <i>Carcharhinus longimanus</i> )	OCS
4	Great hammerhead ( <i>Sphyrna mokarran</i> )	SPM		
5	Pelagic stingray ( <i>Pteroplatytrygon violacea</i> )	PLS		
6	Scalloped hammerhead ( <i>Sphyrna lewini</i> )	SPL		
7	Smooth hammerhead ( <i>Sphyrna zygaena</i> )	SPZ		
8	Longfin mako ( <i>Isurus paucus</i> )	LMA		
9	Dusky shark ( <i>Carcharhinus obscurus</i> )	DUS		
10	Tiger shark ( <i>Galeocerdo cuvier</i> )	TIG		

***Best practice guidelines for the safe release and handling of encircled whale sharks***

SC17.16 (para. 48) The SC reiterated its **RECOMMENDATION** from 2013, that the following *Guidelines for the safe release and handling of encircled whale sharks*, should be added as an additional page in the IOTC shark identification guides:

The methods listed below depend on the condition of the particular purse seine set, e.g. the size and orientation of the encircled animal, size of fish in the purse seine set and operation style.

- Cutting the net when the whale shark is at the surface and separated from the tuna and when the operation presents no danger for the crew;
- Standing the animal on the net and rolling it outside the bunt. A rope placed under the animal and attached to the float line could help rolling the whale shark out of the net;
- Brailing sharks (only for small individual less than 2–3 meters).

The crew should never:

- Pull up the shark by its tail;
- Tow the shark by its tail.

SC17.17 (para. 49) The SC reiterated its **RECOMMENDATION** from 2013, that the Commission allocates funds in its 2015 budget, to produce and print the IOTC best practice guidelines for the safe release and handling of encircled whale sharks, and for these to be incorporated into the existing IOTC “*Shark and ray identification in Indian Ocean pelagic fisheries*”, identification cards.

***Shark fin to body weight ratio and wire leaders/traces***

SC17.18 (para. 50) **NOTING** that the Commission, at its 18<sup>th</sup> Session considered a range of proposals on sharks which included matters relevant to the shark fin to body weight ratio and wire leaders/traces, the SC **RECALLED** its previous advice to the Commission as follows:

- The SC **ADVISED** the Commission to consider, that the best way to encourage full utilisation of sharks, to ensure accurate catch statistics, and to facilitate the collection of biological information, is to revise the IOTC Resolution 05/05 *concerning the conservation of sharks caught in association with fisheries managed by IOTC* such that all sharks must be landed with fins attached (naturally or by other means) to their respective carcass. However, the SC **NOTED** that such an action would have practical implementation and safety issues for some fleets and may degrade the quality of the product in some cases. The SC **RECOMMENDED** all CPCs to obtain and maintain the best possible data for IOTC fisheries impacting upon sharks, including improved species identification.
- On the basis of information presented to the SC in previous years, the SC **RECOGNISED** that the use of wire leaders/traces in longline fisheries may imply targeting of sharks. The SC therefore **RECOMMENDED** to the Commission that if it wishes to reduce catch rates of sharks by longliners it should prohibit the use of wire leaders/traces.

***Marine Turtles: Review of Resolution 12/04 on the conservation of marine turtles***

SC17.19 (para. 52) The SC reiterated its **RECOMMENDATION** from 2013, that at the next revision of IOTC Resolution 12/04 *on the conservation of marine turtles*, the measure is strengthened to ensure that where possible, CPCs report annually on the total estimated level of incidental catches of marine turtles, by species, as provided at [Table 5](#).

**TABLE 5.** Marine turtle species reported as caught in fisheries within the IOTC area of

competence.

Common name	Scientific name
Flatback turtle	<i>Natator depressus</i>
Green turtle	<i>Chelonia mydas</i>
Hawksbill turtle	<i>Eretmochelys imbricata</i>
Leatherback turtle	<i>Dermochelys coriacea</i>
Loggerhead turtle	<i>Caretta caretta</i>
Olive ridley turtle	<i>Lepidochelys olivacea</i>

***Marine mammals: Development of technical advice for marine mammals***

SC17.20 (para. 53) The SC reiterated its **RECOMMENDATION** from 2013, that depredation events be incorporated into Resolution 13/03 at its next revision, so that interactions may be quantified at a range of spatial scales. Depredation events should also be quantified by the regional observer scheme.

***Best practice guidelines for the safe release and handling of encircled cetaceans***

SC17.21 (para. 54) The SC reiterated its **RECOMMENDATION** from 2013, that the Commission allocates funds in its 2015 and 2016 budgets, to produce and print the IOTC best practice guidelines for the safe release and handling of encircled cetaceans. The guidelines could be incorporated into a set of IOTC cetacean identification cards: “*Cetacean identification for Indian Ocean fisheries*”.

***Status of development and implementation of National Plans of Action for seabirds and sharks, and implementation of the FAO guidelines to reduce marine turtle mortality in fishing operations***

SC17.22 (para. 58) The SC **RECOMMENDED** that the Commission note the current status of development and implementation of National Plans of Action (NPOAs) for sharks and seabirds, and the implementation of the FAO guidelines to reduce marine turtle mortality in fishing operations, by each CPC as provided at [Appendix VI](#), recalling that the IPOA-Seabirds and IPOA-Sharks were adopted by the FAO in 1999 and 2000, respectively, and required the development of NPOAs. Despite the time that has elapsed since then, very few CPCs have developed NPOAs, or even carried out assessments to ascertain if the development of a Plan is warranted. Currently only 12 of the 35 IOTC CPCs have an NPOA-Sharks (8 more in development), while only 6 CPCs have an NPOA-Seabirds (2 more in development). A single CPC has determined that an NPOA-Sharks is not needed, and 5 have similarly determined that an NPOA-Seabirds is not needed. Currently only 6 of the 35 IOTC CPCs have implemented the FAO guidelines to reduce marine turtle mortality in fishing operations (2 more in progress), and one CPC (France (OT)) will implement a full NPOA in 2015.

***Summary discussion of matters common to Working Parties (capacity building activities – stock assessment course; connecting science and management, etc.)***

***Meeting participation fund***

SC17.33 (para. 118) **NOTING** that the MPF was used to fund the participation of a reduced number of national scientists to the Working Parties in 2014, 49 national scientists to the Working Party meetings and the SC in 2014 (58 in 2013; 42 in 2012), all of which were required to submit and present a working paper at the meeting, the SC **RECOMMENDED** that the Commission consider the following:

- The IOTC Meeting Participation Fund (MPF), adopted by the Commission in 2010 (Resolution 10/05 *On the establishment of a Meeting Participation Fund for developing IOTC Members and non-Contracting Cooperating Parties*), and now incorporated into the IOTC Rules of Procedure (2014), was established for the purposes of supporting scientists and representatives from IOTC Contracting Parties who are developing States to attend and contribute to the work of the Commission, the Scientific Committee and its Working Parties.
- The Commission has made the following directives to the IOTC Secretariat:
  - a) The Commission had directed the IOTC Secretariat (via Resolution 10/05 and now via the IOTC Rules of Procedure (2014)) to ensure that: (para. 88 of the S18 Report)
    - i. the MPF be utilised, as a first priority, to support the participation of scientists from developing Contracting Parties in scientific meetings of the IOTC, including Working Parties, rather than non-science meetings.
    - ii. the MPF will be allocated in such a way that no more than 25% of the expenditures of the Fund in one year is used to fund attendance to non-scientific meetings.
    - iii. thus, 75% of the annual MPF shall be allocated to facilitating the attendance of

developing Contracting Party scientists to the Scientific Committee and its Working Parties.

- b) The Commission had directed the IOTC Secretariat that any cost savings made on the annual IOTC budget, shall also be used to further supplement the \$60,000 currently budgeted for the MPF.

- In accordance with para. 89 of the S18 Report, the IOTC Secretariat is actively seeking extra budgetary funding sources to supplement the MPF budget from individual Contracting Parties as well as other interested groups. However, the SC was informed by the IOTC Secretariat that other sources should actively be sought by interested candidates, including the UNFSA meeting fund, as well as through their own domestic budgetary processes.

SC17.34 ([para. 119](#)) The SC strongly **RECOMMENDED** that this fund be maintained into the future and increased back to its original allocation of \$200,000 per year.

SC17.35 ([para. 123](#)) The SC **RECOMMENDED** that the MPF rules of procedure be modified, so that a Draft working document, rather than an abstract, be submitted to the relevant Working Party MPF Selection Panel 45 days before the meeting, so that the Panel may review the full paper rather than just the abstract, and provide guidance on areas for improvement and the suitability of the application to receive funding using the MPF. The justification of this request is based upon the reduced funds available and the need to maximise benefits. The SC **AGREED** that until such time as the Commission revises the IOTC Rules of Procedure the MPF selection panels may choose to follow this proposal.

#### *IOTC species identification cards*

SC17.38 ([para. 129](#)) **NOTING** the recent online survey distributed by the IOTC Secretariat, the SC strongly **RECOMMENDED** that the IOTC Secretariat ensure that hard copies of the identification cards continue to be printed as many CPCs scientific observers, both on board and port, still do not have smart phone technology/hardware access and need to have hard copies on board. At this point in time, electronic formats, including ‘applications or apps’ are only suitable for larger scale vessels, and even in the case of EU purse seine vessels, the use of hard copies is relied upon due to on board fish processing and handling conditions, as well as weather conditions.

#### *Identification cards: Marine turtles, seabirds and sharks*

SC17.40 ([para. 132](#)) **NOTING** that funds were approved by the Commission in the 2014 budget to translate and print hard copies of the marine turtle, seabird and shark identification cards, but this was only partially done as the IOTC Secretariat indicated the funds are yet to be received from Members, the SC **RECOMMENDED** that the translation and printing occur as soon as the necessary contributions are received.

#### *Proposed revisions to Resolution 11/04 on a regional observer scheme*

SC17.42 ([para. 159](#)) **RECALLING** the objectives of Resolution 11/04 *on a regional observer scheme* as follows: “Para 1: The objective of the IOTC Observer Scheme shall be to collect verified catch data and other scientific data related to the fisheries for tuna and tuna-like species in the IOTC area of competence” and **NOTING** that the objective of the ROS contained in Resolution 11/04, and the rules contained in Resolution 12/02 *On data confidentiality policy and procedures* makes no reference to the data collected not being used for compliance purposes, the SC **RECOMMENDED** that at the next revision of Resolution 11/04, it be clearly stated that the data collected shall not be used for compliance purposes.

#### *Electronic Monitoring*

SC17.43 ([para. 166](#)) **NOTING** that electronic monitoring (including video) has been trialled and successfully implemented in many fisheries worldwide (e.g. Australia, European Union, USA, New Zealand), with the aim of supplementing scientific observers on board vessels; and given the current difficulties cited as reasons for not deploying scientific observers under the IOTC Regional Observer Scheme (ROS) on board large-scale gillnet vessels operating in the Indian Ocean; the SC **RECOMMENDED** that the Commission considers assigning the IOTC Secretariat, in consultation with interested IOTC scientists, to develop a project on electronic monitoring in the IOTC area of competence. This would allow an evaluation of the efficacy of electronic monitoring in the collection of information on catch, discards and fishing effort as a means to supplement scientific observer coverage for large-scale gillnet vessels. The trial will include an evaluation of the main challenges of using electronic monitoring data such as the accurate identification of IOTC and bycatch species, weight and size of catches and the time taken to process the footage and extract the required data. The concept note/proposal shall also include a clear indication that the IOTC data confidentiality policy (Resolution 12/02) will need to be modified to ensure

any data/information collected is for the sole purpose of scientific analysis and not for compliance purposes. The concept note should include a detailed budget and be communicated to a range of potential funding organisations.

### *Invited Experts*

SC17.47 ([para. 181](#)) The SC **RECOMMENDED** that at least one ‘Invited Expert’ be brought to each of the science Working Parties in 2015 and in each subsequent year, so as to further increase the capacity of the Working Parties to undertake the work detailed in the Program of Work ([Appendix XL](#)). The IOTC regular budget shall include travel funds (flights, DSA) for this purpose. The Invited Expert for each meeting will continue to be selected based on the process adopted by the Scientific Committee and provided at [Appendix XL](#).

### *Consultants*

SC17.48 ([para. 183](#)) **NOTING** the highly beneficial and relevant work done by IOTC stock assessment consultants in 2014 and in previous years, the SC **RECOMMENDED** that engagement by consultants be continued for each coming year based on the Program of Work ([Appendix XXXVIII](#)), to supplement the skill set available within the IOTC Secretariat and CPCs. An indicative budget is provided at [Table 6](#).

**TABLE 6.** Estimated budget required to hire a consultant to carry out stock assessments on tuna and tuna-like species under the IOTC mandate, sharks frequently caught by IOTC fisheries, and capacity building, in 2015 and 2016.

Description	Unit price	Units required	2015 Total (US\$)	2016 Total (US\$)	Priority
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<b>WPEB</b>					
Shark stock assessment (fees)	450	20	9,000	9,000	High
Shark stock assessment (travel)	5,000	1	5,000	5,000	High
Evaluation of the discards ban proposal	450	35	Nil	15,750	Med
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## APPENDIX B

## PROGRAM OF WORK (2015–2019) FOR THE SCIENTIFIC COMMITTEE AND ITS SUBSIDIARY BODIES

The SC **NOTED** the proposed Program of Work and priorities for each of the Working Parties and **AGREED** to a consolidated Program of Work as outlined in Appendix XXXVIII. The Chairs and Vice-Chairs of each working party shall ensure that the efforts of their working party is focused on the core areas contained within the appendix, taking into account any new research priorities identified by the Commission at its next Session. (IOTC–2014–SC17–R, Para. 177)

## Working Party on Ecosystems and Bycatch (WPEB)

(Extracts from IOTC–2014–WPEB10–R: Appendix XVIII, Table 2)

## WPEB: High priority topics, by project for bycatch in the Indian Ocean

Table 2. High priority topics, by project for bycatch in the Indian Ocean.

Topic	Sub-topic and Project	Priority
<b>SHARKS</b>		
Fisheries and data collection	<p>Historical data mining for the key species and IOTC fleets (e.g. as artisanal gillnet and longline coastal fisheries) and implementation of Regional Observer Schemes, including:</p> <ul style="list-style-type: none"> <li>• Capacity building of fisheries observers (including the provision of ID guides, training, etc.);</li> <li>• Define observer scheme (including minimum requirements) for fleets which are believed to have large catches on pelagic sharks (i.e. various longline and gillnet coastal fisheries) and where those statistics are mostly absent;</li> <li>• Historical data mining for the key species, including the collection of information about catch, effort and spatial distribution of those fleets;</li> <li>• Integration of data mining with observer programs to reconstruct species composition and catches of sharks.</li> </ul>	High
Biology and ecology	<p>Develop basic biology and ecology studies to fill essential knowledge gaps on the key IOTC shark species, including:</p> <ul style="list-style-type: none"> <li>• Age and growth studies for the blue (BSH), shortfin mako (SMA) and oceanic whitetip (OCS) sharks;</li> <li>• Stock delimitation identification (i.e., tagging and genetics<sup>2</sup>) for the blue (BSH), shortfin mako (SMA) and oceanic whitetip (OCS) sharks;</li> <li>• Migration and habitat use, including identification of hotspots and investigate associated environmental conditions affecting the sharks distribution, and making use of conventional and electronic tagging, for blue (BSH), shortfin mako (SMA) and oceanic whitetip (OCS) sharks;</li> <li>• Post-release mortality (electronic tagging), to assess the efficiency of management resolutions on no retention species (i.e. oceanic whitetip (OCS) and threshers sharks), shortfin mako sharks SMA) ranked as the most vulnerable species to longline fisheries.</li> </ul>	High
Mitigation measures	<p>Develop studies on shark mitigation measures (operational, technological aspects and best practices), including:</p> <ul style="list-style-type: none"> <li>• Longline selectivity, to assess the effects of hooks styles, bait types and trace materials on shark catch rates, hooking-mortality, bite-offs and fishing yield (socio-economics);</li> <li>• Gillnet selectivity, to assess the effect of mesh size, hanging ratio and net twine on sharks catches composition (i.e. species and size), and fishing yield (socio-economics);</li> <li>• Post-release mortality of whale sharks in purse-seine fisheries, to assess the efficiency of the best practice currently set in place;</li> <li>• Develop guidelines and protocols for safe handling and release of sharks caught on longlines and gillnets fisheries.</li> </ul>	High
CPUE standardisation	<p>Develop standardised CPUE series for each key shark species and fishery in the Indian Ocean</p> <ul style="list-style-type: none"> <li>• (High priority fleets: TWN-CHN LL, EU,Spain LL, Japan LL; Indonesia LL)</li> </ul>	High

<sup>2</sup> Genetic studies might be integrated in a single study including other IOTC tuna and tuna-like species.

Stock assessment / Stock indicators	Develop and compare multiple assessment approaches to determining stock status for key shark species	High
<b>Marine turtles</b>	<p>Review of bycatch mitigation measures</p> <p>Res. 12/04 (para. 11) The IOTC Scientific Committee shall request the IOTC Working Party on Ecosystems and Bycatch to:</p> <ol style="list-style-type: none"> <li>a) Develop recommendations on appropriate mitigation measures for gillnet, longline and purse seine fisheries in the IOTC area;</li> <li>b) Develop regional standards covering data collection, data exchange and training;</li> <li>c) Develop improved FAD designs to reduce the incidence of entanglement of marine turtles, including the use of biodegradable materials.</li> </ol> <p>The recommendations of the IOTC Working Party on Ecosystems and Bycatch shall be provided to the IOTC Scientific Committee for consideration at its annual session in 2012. In developing its recommendations, the IOTC Working Party on Ecosystems and Bycatch shall examine and take into account the information provided by CPCs in accordance with paragraph 10 of this measure, other research available on the effectiveness of various mitigation methods in the IOTC area, mitigation measures and guidelines adopted by other relevant organizations and, in particular, those of the Western and Central Pacific Fisheries Commission. The IOTC Working Party on Ecosystems and Bycatch will specifically consider the effects of circle hooks on target species catch rates, marine turtle mortalities and other bycatch species.</p>	High
	<p>Res. 12/04 (para. 17) The IOTC Scientific Committee shall annually review the information reported by CPCs pursuant to this measure and, as necessary, provide recommendations to the Commission on ways to strengthen efforts to reduce marine turtle interactions with IOTC fisheries.</p>	High
<b>Seabirds</b>	<p>Review of bycatch mitigation measures:</p> <p>Res. 12/06 (para. 8) The IOTC Scientific Committee, based notably on the work of the WPEB and information from CPCs, will analyse the impact of this Resolution on seabird bycatch no later than for the 2016 meeting of the Commission. It shall advise the Commission on any modifications that are required, based on experience to date of the operation of the Resolution and/or further international studies, research or advice on best practice on the issue, in order to make the Resolution more effective.</p>	High
<b>Discards</b>	<p>Review proposal on retention of non-targeted species:</p> <p>The Commission requested that the Scientific Committee review proposal IOTC–2014–S18–PropL Rev_1, and to make recommendations on the benefits of retaining non-targeted species catches, other than those prohibited via IOTC Resolutions, for consideration at the 19th Session of the Commission. (S18 Report, para. 143).</p> <p>Noting the lack of expertise and resources at the WPEB and the short timeframe to fulfill this task, the SC RECOMMENDED that a consultant be hired to conduct this work and present the results at the next WPEB meeting. The following tasks, necessary to address this issue, should be considered for the terms of reference, taking into account all species that are usually discarded on all major gears (i.e., purse-seines, longlines and gillnets), and fisheries that take place on the high seas and in coastal countries EEZs:</p> <ol style="list-style-type: none"> <li>i) Estimate species-specific quantities of discards to assess the importance and potential of this new product supply, integrating data available at the Secretariat from the regional observer programs;</li> <li>ii) Assess the species-specific percentage of discards that is captured dead versus alive, as well as the post-release mortality of species that are discarded alive, in order to estimate what will be the added fishing mortality to the populations, based on the best current information;</li> <li>iii) Assess the feasibility of full retention, taking into account the specificities of the fleets that operate with different gears and their fishing practices (e.g., transshipment, onboard storage capacity).</li> <li>iv) Assess the capacity of the landing port facilities to handle and process this catch.</li> <li>v) Assess the socio-economic impacts of retaining non-target species, including the feasibility to market those species that are usually not retained by those gears;</li> <li>vi) Assess the benefits in terms of improving the catch statistics through port-sampling programmes;</li> <li>vii) Evaluate the impacts of full retention on the conditions of work and data quality collected by onboard scientific observers, making sure that there is a strict distinction between scientific observer tasks and compliance issues.</li> </ol>	High

**WPEB:** Proposed timeline for the development of the high priority research projects.

Project	Task	Year 1 - 2015				Year 2 - 2016				Year 3 - 2017				Year 4 - 2018				Year 5 - 2019			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Fisheries and data collection	Capacity building of fisheries observers (including the provision of ID guides, training, etc.)																				
	Define observer scheme (including minimum requirements) for fleets which are believed to have large catches on pelagic sharks (i.e. various longline and gillnet coastal fisheries) and where those statistics are mostly absent																				
	Historical data mining for the key species, including the collection of information about catch, effort and spatial distribution of those fleets																				
	Integration of data mining with observer programs to reconstruct species composition and catches of sharks																				
	Reporting to the IOTC WPEB and IOTC SC																				
Biology and ecology	Age and growth studies for the blue (BSH), shortfin mako (SMA) and oceanic whitetip (OCS) sharks																				
	Stock delimitation identification (i.e., tagging and genetics*) for the blue (BSH), shortfin mako (SMA) and oceanic whitetip (OCS) sharks																				
	Migration and habitat use, including identification of hotspots and investigate associated environmental conditions affecting the sharks distribution, and making use of conventional and electronic tagging, for blue (BSH), shortfin mako (SMA) and oceanic whitetip (OCS) sharks																				

	Post-release mortality (electronic tagging), to assess the efficiency of management resolutions on no retention species (i.e. oceanic whitetip (OCS) and threshers sharks) and shotfin mako (SMA) the most vulnerable species on longline fisheries	SMA	THR	OCS				
	Reporting to the IOTC WPEB and IOTC SC							
<b>Mitigation measures</b>	Longline selectivity, to assess the effects of hooks styles, bait types and trace materials on shark catch rates, hooking-mortality, bite-offs and fishing yield (socio-economics)							
	Gillnet selectivity, to assess the effect of mesh size, hanging ratio and net twine on sharks catches composition (i.e. species and size)							
	Post-release mortality of whale sharks in purse-seine fisheries, to assess the efficiency of the best practice currently set in place							
	Develop guidelines and protocols for safe handling and release of sharks caught on longlines and gillnets fisheries							
	Reporting to the IOTC WPEB and IOTC SC							

\* Genetic studies might be integrated in a single study including other IOTC tuna and tuna-like species.

### APPENDIX C

## SCHEDULE OF STOCK ASSESSMENTS FOR IOTC SPECIES AND SPECIES OF INTEREST FROM 2015–2019, AND FOR OTHER WORKING PARTY PRIORITIES

The SC **ADOPTED** a revised assessment schedule, ecological risk assessment and other core projects for 2015–19, for the tuna and tuna-like species under the IOTC mandate, as well as the current list of key shark species of interest, as outlined in [Appendix XXXIX](#). (IOTC–2014–SC17–R, Para. 180)

*Extract of the Report of the 17<sup>th</sup> Session of the Scientific Committee  
(IOTC–2014–SC17–R; Appendix XXXIX, PAGE 342)*

Species	2015	2016	2017	2018	2019
<b>Working Party on Ecosystems and Bycatch</b>					
Blue shark	<b>Full assessment</b>		Indicators	Revisit ERA	<b>Full assessment</b>
Oceanic whitetip shark	–	Indicators; Review of measures in Res. 13/06	<b>Full assessment*</b>	Revisit ERA	–
Scalloped hammerhead shark	–	Indicators	–	Revisit ERA	Indicators
Shortfin mako shark	–	Indicators	–	Revisit ERA	–
Silky shark	Indicators	–	–	Revisit ERA	Indicators
Bigeye thresher shark	–	–	Indicators	Revisit ERA	–
Pelagic thresher shark	–	Indicators	–	Revisit ERA	–
Marine turtles	Review of mitigation measures in 12/04	–	Revisit ERA	–	Review of mitigation measures in 12/04
Seabirds	Review of mitigation measures in 12/06	–	Review of mitigation measures in 12/06	–	Review of mitigation measures in 12/06
Marine Mammals	–	–	–	–	–

\*Including data poor stock assessment methods; Note: the assessment schedule may be changed dependant on the annual review of fishery indicators, or SC and Commission requests. ALB: albacore; BET: bigeye tuna; YFT: yellowfin tuna; SKJ: skipjack tuna.