

## QUALITY AND PROVISION OF SCIENTIFIC ADVICE

PREPARED BY: IOTC SECRETARIAT, 15 JANUARY 2015

**REVIEW AREA:** *Conservation and management*

**GENERAL CRITERION:** *Quality and provision of scientific advice*

**DETAILED CRITERIA:**

- 1) Extent to which the IOTC receives and/or produces the best scientific advice relevant to the fish stocks and other living marine resources under its purview, as well as to the effects of fishing on the marine environment.
- 2) Extent to which science data that impacts compliance processes is shared, discussed and utilised.

**SUPPORTING INFORMATION**

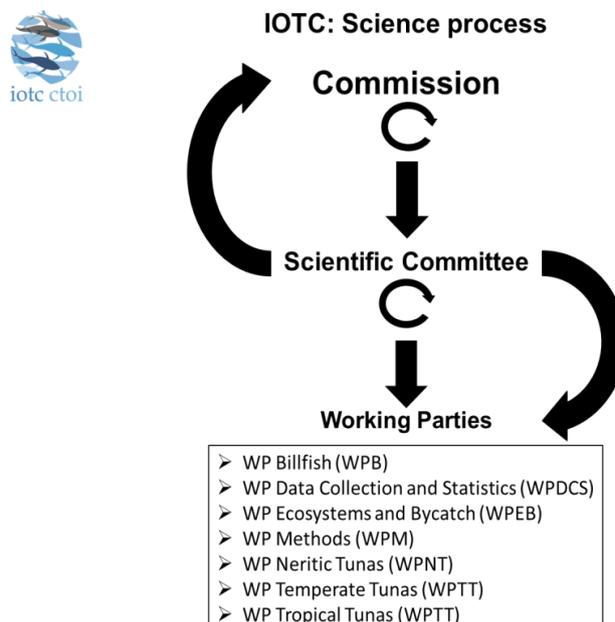
The IOTC is essentially based on a three-step approach:

- 1) Collection of information on fisheries and scientific analysis to supply advice as needed.
- 2) Decision-making on the basis of the advice received.
- 3) Implementation and monitoring of compliance with the actions agreed.

The primary functions of the Scientific Committee and its Working Parties are to provide the Commission with the information it needs to manage fish stocks under the IOTC mandate, as well as the ecosystems in which the fisheries operate. The relationships among the Commission, the Scientific Committee and its Working Parties are illustrated below. In essence, the Working Parties comprise technical experts operating in an individual capacity i.e. they are not necessarily scientists from Member countries. The Working Parties are creative environments where technical scientific debates and analytical work is undertaken. Each working party advises the Scientific Committee on their findings by way of a report.

The Scientific Committee is a more formalised environment where Commission Members (Contracting Parties) are represented and procedures are specified in the IOTC Rules of Procedure (2014). Scientific Committee meetings are attended by a mixture of technical, policy and management experts. Typically the meeting does not undertake any technical work but rather reviews, endorses, and tasks the work of the Working Parties. The Scientific Committee provides advice to the Commission by way of a report.

The IOTC Science Process, which is supported by the IOTC Secretariat at all stages, is shown diagrammatically below:



## 1. *Scientific Committee: Roles and duties*

The Scientific Committee was established as an advisory body to the Commission. The Scientific Committee is constituted of scientists from the IOTC Membership, as well as experts to enhance and broaden the expertise of the Scientific Committee and of its Working Parties. The Scientific Committee has met annually since 1998, with the most recent Session held in December 2014 (SC17).

The main activities of the Scientific Committee are as follows:

- Recommend policies and procedures for the collection, processing, dissemination and analysis of fishery data;
- Facilitate the exchange and critical review among scientists of information on research and operation of fisheries of relevance to the Commission;
- Develop and coordinate cooperative research programs involving Members of the Commission and other interested parties, in support of fisheries management;
- Assess and report to the Commission on the status of stocks of relevance to the Commission and the likely effects of further fishing and of different fishing patterns and intensities;
- Formulate and report to the sub-commission, as appropriate, on recommendations concerning conservation, fisheries management and research, including consensus, majority and minority views.

The complete terms of reference and rules of procedure for the Scientific Committee are detailed in Appendix IV of the IOTC Rules of Procedure (2014), which are available for download at the following link:

- English: <http://iotc.org/documents/indian-ocean-tuna-commission-rules-procedure-2014>
- French: <http://iotc.org/fr/documents/r%C3%A8glement-int%C3%A9rieur-de-la-commission-des-thons-de-l%E2%80%99oc%C3%A9an-indien-2014>

At present, the Scientific Committee is supported by 7 active Working Parties, as well as informal working groups tasked with specific projects to feed into the process. The 7 active working parties are detailed in the following sections.

## 2. *Working Parties: Roles and duties*

All of the Scientific Committee's Working Parties are governed by the following general Terms of Reference that support the scientific process, and reflect the Scientific Committee's mandate to provide the Commission with the information it needs to manage IOTC stocks in accordance with the IOTC Agreement.

The work of the Working Parties will include the specific tasks listed below:

- Review new information on the biology and stock structure of the relevant species, their fisheries and environmental data.
- Coordinate and promote collaborative research on the species and their fisheries.
- Develop and identify agreed models and procedures for the assessment of stock status of each species.
- Conduct stock assessments for each species or stock.
- Provide technical advice on management options, the implications of management measures and other issues relevant to species managed.
- Identify research priorities, and specify data and information requirements that are necessary for the Working Party to meet its responsibilities.

### 2.1 Working Party on Billfish (WPB)

To review and analyse issues relevant to the fisheries and status of the five billfish species under the IOTC mandate:

- Black marlin (BLM: *Makaira indica*)
- Blue marlin (BUM: *Makaira nigricans*)
- Striped marlin (MLS: *Tetrapturus audax*)
- Indo-Pacific sailfish (SFA: *Istiophorus platypterus*)
- Swordfish (SWO: *Xiphias gladius*)

WPB webpages:

- English: <http://iotc.org/science/wp/working-party-billfish-wpb>
- French: <http://iotc.org/fr/science/gt/groupe-de-travail-sur-les-poissons-porte-%C3%A9p%C3%A9es-gtpp>

### 2.2 Working Party on Data Collection and Statistics (WPDCS)

The WPDCS is dedicated to the task of reviewing IOTC data requirements and the quality of the statistics available for tuna, tuna-like, and other species of interest to the IOTC, and to review the status of collection, processing, and reporting of data, as required by the Commission. Based on this review, the Working Party recommends changes to the IOTC data requirements and actions to improve the quality of statistics in countries having data collection or

reporting that falls short of the IOTC requirements. The WPDCS also has role of compiling data recommendations relating to species covered by other working parties and follow-up on the implementation of these actions in the countries concerned.

WPDCS webpages:

- English: <http://iotc.org/science/wp/working-party-data-collection-and-statistics-wpdc>
- French: <http://iotc.org/fr/science/gt/groupe-de-travail-sur-la-collecte-des-donn%C3%A9es-et-les-statistiques-gtcds>

### 2.3 Working Party on Ecosystems and Bycatch (WPEB)

The WPEB reviews and analyses matters relevant to bycatch, byproduct and non-target species which are affected by IOTC fisheries for tuna and tuna-like species (i.e. sharks, marine turtles, seabirds, marine mammals and other fishes), as well as the ecosystems in which they operate; and to develop mechanisms which can be used to better integrate ecosystem considerations into the scientific advice provided by the Scientific Committee to the Commission.

- Blue shark (BSH: *Prionace glauca*)
- Oceanic whitetip shark (OCS: *Carcharhinus longimanus*)
- Scalloped hammerhead shark (SPL: *Sphyrna lewini*)
- Shortfin mako shark (SMA: *Isurus oxyrinchus*)
- Silky shark (FAL: *Carcharhinus falciformis*)
- Bigeye thresher shark (BTH: *Alopias superciliosus*)
- Pelagic thresher shark (PTH: *Alopias pelagicus*)
- Marine turtles in the Indian Ocean
- Seabirds in the Indian Ocean
- Other non-target species

WPEB webpages:

- English: <http://iotc.org/science/wp/working-party-ecosystems-and-bycatch-wpeb>
- French: <http://iotc.org/fr/science/gt/groupe-de-travail-sur-les-%C3%A9cosyst%C3%A8mes-et-les-prises-accessoires-gtepa>

### 2.4. Working Party on Methods (WPM)

The WPM reviews and analyses methodological issues relevant to the assessment of the status of species under the IOTC mandate (outcomes are usually applicable to many of the other Working Parties). In addition, the WPM is tasked with undertaking the Management Strategy Evaluation (MSE) of IOTC species, initially, skipjack tuna (*Katsuwonus pelamis*), yellowfin tuna (*Thunnus albacares*), albacore (*Thunnus alalunga*), bigeye tuna (*Thunnus obesus*) and swordfish (*Xiphias gladius*). This is a new and primary undertaking of the Commissions activity since the last review and deals with implementing of the precautionary approach to fisheries management within the IOTC.

WPMS webpages:

- English: <http://iotc.org/science/wp/working-party-methods-wpm>
- French: <http://iotc.org/fr/science/gt/groupe-de-travail-sur-les-m%C3%A9thodes-gtm>

### 2.5 Working Party on Neritic Tunas (WPNT)

The WPNT reviews and analyses issues relevant to the fisheries and status of the six neritic tuna and tuna-like (mackerel - seerfish) species under the IOTC mandate.

- Bullet tuna (BLT: *Auxis rochei*)
- Frigate tuna (FRI: *Auxis thazard*)
- Kawakawa (KAW: *Euthynnus affinis*)
- Longtail tuna (LOT: *Thunnus tonggol*)
- Indo-Pacific king mackerel (GUT: *Scomberomorus guttatus*)
- Narrow-barred Spanish mackerel (COM: *Scomberomorus commerson*)

WPNT webpages:

- English: <http://iotc.org/science/wp/working-party-neritic-tunas-wpnt>
- French: <http://iotc.org/fr/science/gt/groupe-de-travail-sur-les-thons-n%C3%A9ritiques-gttn>

## 2.6 Working Party on Temperate Tunas (WPTmT)

The WPTmT reviews and analyses issues relevant to the fisheries and status of the two temperate tuna species under the IOTC mandate, noting that southern bluefin tuna has been passed to CCSBT for management.

- Albacore (ALB: *Thunnus alalunga*)

WPTmT webpages:

- English: <http://iotc.org/science/wp/working-party-temperate-tunas-wptmt>
- French: <http://iotc.org/fr/science/gt/groupe-de-travail-sur-les-thons-temp%C3%A9r%C3%A9s-gtttm>

## 2.7 Working Party on Tropical Tunas (WPTT)

The WPTT reviews and analyses issues relevant to the fisheries and status of the three tropical tuna species under the IOTC mandate.

- Bigeye tuna (BET: *Thunnus obesus*)
- Skipjack tuna (SKJ: *Katsuwonus pelamis*)
- Yellowfin tuna (YFT: *Thunnus albacares*)

WPTT webpages:

- English: <http://iotc.org/science/wp/working-party-tropical-tunas-wptt>
- French: <http://iotc.org/fr/science/gt/groupe-de-travail-sur-les-thons-tropicaux-gttt>

## 3. Meeting frequency

The Working Parties have met according to the priorities determined by the Commission and Scientific Committee ([Table 1](#)). The Working Party on Temperate Tunas has now agreed to meet once every two years. All other meetings are scheduled to meet in 2015.

**Table 1.** IOTC Scientific Committee and Working Party meeting history.

Meeting	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	
Scientific Committee																			
WP Billfish																			
WP Data Collection and Statistics																			
WP Ecosystems and Bycatch																			
WP Methods																			
WP Neritic Tunas																			
WP Temperate Tunas																			
WP Tropical Tunas																			
<i>Working Parties no longer active</i>																			
WP Tagging																			
WP Fishing capacity																			

## 4. Meeting participation and scientific contribution

The IOTC relies on research and analyses being undertaken by national scientists, with additional input from IOTC Secretariat staff, Invited Experts and Consultants hired by the Commission. The level of participation by CPCs at the annual Scientific Committee meeting and the Working Parties varies from year to year ([Table 2](#)).

**Table 2.** Scientific Meetings held in 2014, prior to the 17<sup>th</sup> Session of the IOTC Scientific Committee meeting. Numbers in brackets represent numbers for the previous working party meeting.

Working Party	Date and place of most recent meeting	No. of participants					Meeting Participation Fund					No. of documents (and for the previous meeting)
		2010	2011	2012	2013	2014	2010	2011	2012	2013	2014	
Neritic Tunas	29 June–2 July 2014 Phuket, Thailand	–	28	35	42	37	–	9 <sup>1</sup>	10	11	13	Total: 36 (40) Working papers: 34 (34) Information papers: 2 (6)
Temperate Tunas	28–31 July 2014 Busan, Rep. of Korea	15*	16	26	–	27	–	2	3	–	3	Total : 30 (28) Working paper : 26 (19) Information papers : 4 (9)
Billfish	21–25 October 2014 Yokohama, Japan	12	27	23	24	21	0	5	5	10	4	Total: 29 (35) Working papers: 27 (32) Information papers: 2 (3)
Ecosystems and Bycatch	27–31 October 2014 Yokohama, Japan	37	49	48	32	37	9 <sup>2</sup>	7 <sup>3</sup>	7	11	5	Total: 61 (64) Working papers: 34 (47) Information papers: 27 (17)
Tropical Tunas	15–19 November 2014 Bali, Indonesia	39	49	47	46	53	11	13	8	10	6	Total: 57 (51) Working papers: 42 (40) Information papers: 15 (11)
Data Collection and Statistics	2–4 December Seychelles	28	21	–	23	30	–	2	–	5	1	Total: 21 (18) Working papers: 12 (17) Information papers: 9 (1)
Methods	5–6 December Seychelles	18*	–	22	–	28	–	–	1	–	3 <sup>4</sup>	Total: 11 (15) Working papers: 9 (4) Information papers: 2 (11)
Scientific Committee	8–12 December Seychelles	41	50	54	75	62	7	10	12	11	15	Working papers: 9 (17) Executive Summaries: 25 National Reports: 26 (28) Information papers: 1 (15)

\*2008.

<sup>1</sup> Another 7 scientists were supported by IOTC through the Capacity Building funds as they were also attending the capacity building workshop in Chennai, India (WPNT01)<sup>2</sup> 6 scientists attended both the WPTT and WPEB<sup>3</sup> 3 scientists attended both the WPTT and WPEB<sup>4</sup> 3 scientists attended both the WPM and SC

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 level of participation by developing Members of the Commission has varied from year to year and from meeting to meeting ([Table 2](#)). In 2014, 49 national scientists to the Working Party meetings and the SC in 2014 (58 in 2013; 42 in 2012; 33 in 2011; 19 in 2010), all of which were required to submit and present a working paper at the meeting. MPF recipients presented 33 working documents in 2014 (47 in 2013, 36 in 2012) to the various Working Party meetings, and 15 National Reports (11 in 2013, 12 in 2012) to the Scientific Committee, as detailed in [Table 2](#).

#### 4.1 CPC participation to the Scientific Committee

The level of participation by CPCs to the annual Scientific Committee meetings has varied greatly since 1998, with many CPCs being in attendance at every meeting ([Table 3](#)). However, there are others who rarely, if at all, attend the annual Session which is likely to have an impact on the ability of the CPC Commissioner to fully comprehend the advice coming from the Scientific Committee to the Commission each year.

**Table 3.** The numbers of participants attending each meeting of the Scientific Committee. The date in the brackets next to the Contracting (Member) name indicates when membership began or Cooperating Non-Contracting Party (CNCP) status was granted.

Contracting Party	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Australia (Nov 1996)	3	2	2	1	2	4	1	1	1	1	1	1	1	2	1	1	2
Belize (May 2007)																	
China (Oct 1998)	2	1	2	2	1	3	1	1	1	1	1	1			2	2	2
Comoros (Aug 2001)	3	3		4									2	1	1	1	1
Eritrea (Aug 1994)				1													
European Union (Oct 1995)	4	3	4	7	7	9	11	9	9	9	9	8	9	13	10	10	11
France (OT) (Dec 1996)	1	3	1	2	4		2	1							3	2	2
Guinea (Jan 2005)																	
India (Mar 1995)	1	1	1	1	1	1			1	1		1	1	1	1	3	2
Indonesia (Jul 2007)						1								2	2	7	6
Iran, Islamic Republic (Jan 2002)			1	1											1		1
Japan (Jun 1996)	6	17	2	6	5	9	3	3	2	3	3	3	2	3	4	6	5
Kenya (Sep 2004)										1	1	2	1	1	1	1	2
Korea, Republic of (Mar 1996)	0	1	1	1	1	1	1	1	1	1	1	1	1	3	2	6	3
Madagascar (Jan 1996)	3	1											2		1	1	1
Malaysia (May 1998)	1	1													1	1	1
Maldives (July 2011)													1	2	2	1	2
Mauritius (Dec 1994)	0	1	1	1	1						1	1	1	1	1	1	1
Mozambique (Feb 2012)															3	3	1
Oman (Apr 2000)						1											
Pakistan (Apr 1995)																	
Philippines (Jan 2004)																	
Seychelles (Jul 1995)	3	2	3	4	5	3	2	4	4	4	6	5	2	3	3	2	3
Sierra Leone (Jul 2008)																	
Somalia (May 2014)																	1
Sri Lanka (Jun 1994)		1				1	1		1	1				1	2	3	1
Sudan (Dec 1996)		1													1		
Tanzania (Apr 2007)	1	1														1	1
Thailand (Mar 1997)	2	3	2	2	2	2	2	2	2	2		3	1	3	2	1	2
U.K. (OT) (Mar 1995)	2	1	1	1	1	2	1	1	1	1	1	1	1	1	2	1	1
Vanuatu (Oct 2002)																1	
Yemen (July 2012)																	
<b>Cooperating Non-Contracting Party (CNCP)</b>																	
Djibouti (June 2014)																	

Senegal (May 2006)																	
South Africa (Jun 2005)		1					1				1	1	3				2
Uruguay (May 2007)																	
<b>Other</b>																	
Invited experts				2	1	1	2	3	2	4	2	2	2	3	3	3	2
Observers	7	5	3	4	6	2	3	5	7	7	5	6	6	8	6	9	7

#### 4.2 CPC participation to the Working Parties of the Scientific Committee

The level of participation by CPCs to the Working Parties is very meeting specific, with some CPCs having little technical interest in some of the meetings, thus the numbers are not provided here, but rather, in the individual working party reports freely available from the IOTC website.

#### 4.3 Invited Experts

The IOTC Secretariat facilitates the participation of Invited Experts that were selected to attend each of the Working Party meetings. The participation by experts was a recommendation of the 1<sup>st</sup> Performance Review and has greatly enhanced the capacity within particular working parties. The names and affiliations of the 24 Invited Experts brought to the Working Party meetings since the recommendation of the 1<sup>st</sup> Performance Review are provided in [Table 4](#).

**Table 4.** Invited Experts for Working Party meetings.

Working Party	2010	2011	2012	2013	2014
Neritic Tunas	N/A	Dr. Shane Griffiths (CSIRO, <b>Australia</b> )	Dr. Shane Griffiths (CSIRO, <b>Australia</b> )	Dr. Shiji Zhou (CSIRO, <b>Australia</b> )	Dr. Shiji Zhou (CSIRO, <b>Australia</b> )
Temperate Tunas	N/A	Dr Simon Hoyle (Secretariat of the Pacific Community)	Dr Simon Hoyle (Independent consultant, <b>New Zealand</b> )	N/A	Dr Simon Hoyle (Independent consultant, <b>New Zealand</b> )
Billfish	Dr. Steve Martell (University of British Columbia, <b>Canada</b> )	Dr. Toshihide Kitakado (Tokyo University of Marine Science and Technology, <b>Japan</b> )	Dr. Humber Andrade (Universidade Federal Rural de Pernambuco, <b>Brazil</b> )	Dr. Humber Andrade (Universidade Federal Rural de Pernambuco, <b>Brazil</b> )	Dr. Humber Andrade (Universidade Federal Rural de Pernambuco, <b>Brazil</b> )
Ecosystems and Bycatch	Nil	Dr. Evgeny Romanov (CAPRUN-ARDA, La Réunion, <b>France</b> )	Dr. Robert Olsen (Inter-American Tropical Tuna Commission, <b>USA</b> )	Dr. Ronel Nel, (Nelson Mandela Metropolitan University, <b>South Africa</b> )	Dr. Joel Rice (Secretariat of the Pacific Community)
Tropical Tunas	Dr. Ian Taylor (Louisiana State University, <b>USA</b> )	Dr. Joe Powers (Louisiana State University, <b>USA</b> )  Ms. Paige Eveson CSIRO, <b>Australia</b> )	Dr. Andrew Cooper (Simon Fraser University, <b>Canada</b> )	Dr. Andrew Cooper (Simon Fraser University, <b>Canada</b> )	Dr. Simon Hoyle (Independent consultant, <b>New Zealand</b> )

#### 4.4 Consultants

The IOTC Secretariat facilitates the participation of Consultants that were selected to attend Working Party meetings to present stock assessment models or other tasks as requested by the Scientific Committee and funded by the Commission. The participation by consultants was a recommendation of the 1<sup>st</sup> Performance Review and has greatly enhanced the capacity within particular working parties. The names and affiliations of the consultants brought to the Working Party meetings since the recommendation of the 1<sup>st</sup> Performance Review are provided in [Table 5](#), as well as the species for which an assessment was carried out.

**Table 5.** Consultant for stock assessments.

Working Party	2010	2011	2012	2013	2014
Neritic Tunas	N/A	Nil	Nil	Nil	Nil
Temperate Tunas	N/A	Nil	Nil	N/A	Dr Simon Hoyle ( <b>New Zealand</b> )

Billfish	Nil	Nil	Nil	Nil	Nil
Ecosystems and Bycatch	Nil	Nil	Nil	Nil	Nil
Tropical Tunas	Yellowfin tuna stock assessment: Dr Adam Langley (New Zealand)	Yellowfin tuna stock assessment: Dr Adam Langley (New Zealand)	Yellowfin tuna stock assessment: Dr Adam Langley (New Zealand)	Bigeeye tuna stock assessment: Dr Adam Langley (New Zealand)	Nil

### 5. Role of the IOTC Secretariat in technical matters

The IOTC Secretariat currently provides the following services in the scientific processes of the Commission:

- Advice and training in data collection;
- Advice and training on stock assessment methods;
- Advice, management and coordination of a limited range of scientific activities (e.g. previously tagging; CPUE standardisation);
- Preparation and provision of summary mandatory fisheries statistics for use by CPCs for research and the production of stock assessments (e.g. catch at size and catch at age);
- Preparation and reporting on the status of the IOTC databases to Working Parties;
- Drafting of species Executives Summaries;
- Drafting and production of the Working Party and Scientific Committee reports;
- Organisation of the Working Parties and Scientific Committee;
- Preparation of background documents for the Working Parties and the Scientific Committee;
- Stock assessments on species as determined by the Scientific Committee.

### Staffing

The IOTC Secretariat's scientific support services area is currently staffed by six (6) personnel as follows:

- Deputy Secretary/Science Manager (P5)
- Fishery Officer (Stock Assessment) (P4)
- Fishery Officer (Data Coordinator) (P4)
- Fishery Officer (Statistics) (P3)
- Fishery Officer (Science) (P3)
- General Clerk (Data Assistant) (G6)

### 6. Science data and compliance: sharing, discussion and utilisation

The IOTC Secretariat annually develops Compliance Reports for each CPC, which summarises the level of compliance by IOTC Members and Cooperating Non-Contracting Parties (CPCs) to some of the more prominent IOTC Resolutions adopted in past sessions of the Commission. This includes data collected as part of the science process. The SC in 2013 forwarded a number of recommendations having a Compliance element to be discussed at the Compliance Committee. However, recently the IOTC Working Party on Ecosystems and Bycatch, and the Scientific Committee have expressed concern on how data collected under the Regional Observer Scheme may be used for compliance purposes. As such, the SC, at its 17<sup>th</sup> Session in 2014 made the following statement and Recommendation to the Commission:

#### Resolution 11/04 On a regional observer scheme

SC17 Report, para. 89: *The SC **RECALLED** 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”*

SC17 Report, para. 90: **NOTING** that the objective of the Regional Observer Scheme 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 within the Regional Observer Scheme shall not be used for compliance purposes.