

The background of the slide is a deep blue ocean with several tuna fish swimming. One large tuna is in the center, swimming towards the left. Another is in the top right, and a third is in the bottom right. The water has a textured, slightly grainy appearance.

3rd WORKSHOP ON CONNECTING THE IOTC SCIENCE AND MANAGEMENT PROCESSES (SMWS03)

Development and effective communication of
scientifically-based management advice

**INDIAN OCEAN TUNA COMMISSION
Secretariat**

Presented by David T. Wilson



SCIENTIFIC ADVICE: INFORMATION SOURCES FOR MANAGERS

Primary:

- **Scientific Committee Report:** Annual (Only current/valid for 1 year)
Note: at last years Commission meeting reference was made to previous years: Incorrect
- **Species/Stock Executive Summaries:** In SC Report and on Website
<http://iotc.org/science/status-summary-species-tuna-and-tuna-species-under-iotc-mandate-well-other-species-impacted-iotc>
- **IOTC Website:** Various <http://iotc.org/>



REPORTING AND SPECIES EXECUTIVE SUMMARIES

Prior to 2010, Members of the Commission called upon the Scientific Committee to improve the way in which it provides advice to the Commission as well as to improve the overall format of its Reports and those of its subsidiary bodies.

2011

SC adopts a revised Executive Summary format;
Commences a process to modify the way it provides 'Recommendations'

2013

SC adopts revised reporting terminology to provide greater clarity when communicating within the Commission's structure

2012

SC further refines the Executive Summaries;
Restructures the reports of the SC and WPs

2014

SC further refines the Executive Summaries;
Restructures the reports of the SC and WPs



HOW TO USE THE SCIENTIFIC COMMITTEE REPORT

IOTC-2014-SC17-R



IMPROVEMENTS TO REPORTING

Standardisation of IOTC Working Party and Scientific Committee report terminology

2013: SC16.07 (para. 23)

The SC **ADOPTED** the reporting terminology contained in Appendix IV and **RECOMMENDED** that the Commission considers adopting the standardised IOTC Report terminology, to further improve the clarity of information sharing from, and among its subsidiary bodies.

2014: At its 18th Session, the Commission endorsed the recommendation by the SC to adopt the reporting terminology contained in Appendix IV of the SC16 Report.



REPORTING

TERMINOLOGY CONTAINED SCIENCE REPORTS

Level 1: From a subsidiary body of the Commission to the next level in the structure of the Commission:

RECOMMENDED, RECOMMENDATION

Any conclusion or request for an action to be undertaken, from a subsidiary body of the Commission (Committee or Working Party), which is to be formally provided to the next level in the structure of the Commission for its consideration/endorsement (e.g. from a Working Party to the Scientific Committee; from a Committee to the Commission).

The intention is that the higher body will consider the recommended action for endorsement under its own mandate, if the subsidiary body does not already have the required mandate. Ideally this should be task specific and contain a timeframe for completion.



REPORTING

Level 2: From a subsidiary body of the Commission to a CPC, the IOTC Secretariat, or other body (not the Commission) to carry out a specified task:

REQUESTED

This term should only be used by a subsidiary body of the Commission if it does not wish to have the request formally adopted/endorsed by the next level in the structure of the Commission.

For example, if a Committee wishes to seek additional input from a CPC on a particular topic, but does not wish to formalise the request beyond the mandate of the Committee, it may request that a set action be undertaken.

Ideally this should be task specific and contain a timeframe for the completion.



REPORTING

Level 3: General terms to be used for consistency:

AGREED / NOTED / NOTING

Any point of discussion from a meeting which the IOTC body considers to be an agreed course of action covered by its mandate, which has not already been dealt with under Level 1 or level 2 above; a general point of agreement among delegations/participants of a meeting which does not need to be considered/adopted by the next level in the Commission's structure.

Any point of discussion from a meeting which the IOTC body considers to be important enough to record in a meeting report for future reference.

REPORTING

Level 4: Any other term:

e.g. **CONSIDERED; URGED; ACKNOWLEDGED**

Any other term may be used in addition to the Level 3 terms to highlight to the reader of and IOTC report, the importance of the relevant paragraph.

However, other terms used are considered for explanatory/informational purposes only and shall have no higher rating within the reporting terminology hierarchy than Level 3, described above



SCIENTIFIC COMMITTEE REPORT

Key sections: Must read!!!!

- 1) **Executive Summary for Report (a few pages)**: The key, or most important recommendations arising from the meeting
 - Always the 6 'Stock Status' Recommendations (plus links)
 - Other important Recommendations, usually of direct relevance to a request from the Commission.
- 2) **Status summary (Table 1) (a few pages)**: A brief summary of stock status and links to the Executive Summaries.

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SCIENTIFIC COMMITTEE REPORT

Supporting information: Reference only!!!

- 1) **Report body (37 pages):** Administrative, other background for reference.
- 2) **Other Appendices:** For reference/recording purposes



SPECIES EXECUTIVE SUMMARIES: MANAGEMENT ADVICE

Content and format: How to use

1) STATUS PAGE:

- 1) Key indicators, including colour code
- 2) Management Advice: Stock status and Outlook (Kobe plot, K2SM etc.)

2) Supporting Information (essentially an appendix)

- 1) Applicable CMMs
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SPECIES EXECUTIVE SUMMARIES: MANAGEMENT ADVICE

EXECUTIVE SUMMARY: BIGEYE TUNA



Indian Ocean Tuna Commission
Commission des Thons de l'Océan Indien



Status of the Indian Ocean bigeye tuna (BET: *Thunnus obesus*) resource

TABLE 1. Bigeye tuna: Status of bigeye tuna (*Thunnus obesus*) in the Indian Ocean.

Area ¹	Indicators	2014 stock status ² determination
Indian Ocean	Catch in 2013:	109,343 t
	Average catch 2009–2013:	105,924 t
	MSY (1,000 t) (plausible range):	132 (98–207) ³
	F _{MSY} (plausible range):	n.a. (n.a.–n.a.) ³
	SB _{MSY} (1,000 t) (plausible range):	474 (295–677) ³
F ₂₀₁₂ /F _{MSY} (plausible range):	0.42 (0.21–0.80) ³	Green
SB ₂₀₁₂ /SB _{MSY} (plausible range):	1.44 (0.87–2.22) ³	
SB ₂₀₁₂ /SB ₀ (plausible range):	0.40 (0.27–0.54) ³	

¹Boundaries for the Indian Ocean stock assessment are defined as the IOTC area of competence.

²The stock status refers to the most recent years' data used in the assessment.

³The point estimate is the median of the plausible models investigated in the 2013 SS3 assessment.

Colour key	Stock overfished ($SB_{year}/SB_{MSY} < 1$)	Stock not overfished ($SB_{year}/SB_{MSY} \geq 1$)
Stock subject to overfishing ($F_{year}/F_{MSY} > 1$)		
Stock not subject to overfishing ($F_{year}/F_{MSY} \leq 1$)		
Not assessed/Uncertain		



SPECIES EXECUTIVE SUMMARIES: MANAGEMENT ADVICE

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. No new stock assessment was carried out for bigeye tuna in 2014, thus, stock status is determined on the basis of the 2013 assessment and other indicators presented in 2014. The 2013 stock assessment model results did not differ substantively from the previous (2010 and 2011) assessments; however, the final overall estimates of stock status differ somewhat due to the revision of the catch history and updated standardised CPUE indices. All the runs (except 2 extremes) carried out in 2013 indicate the stock is above a biomass level that would produce MSY in the long term (i.e. $SB_{2012}/SB_{MSY} > 1$) and in all runs that current fishing mortality is below the MSY-based reference level (i.e. $F_{2012}/F_{MSY} < 1$) ([Table 1](#) and [Fig. 1](#)). The median value of MSY from the model runs investigated was 132,000 t with a range between 98,000 and 207,000 t. Current spawning stock biomass was estimated to be 40% ([Table 1](#)) of the unfished levels. Catches in 2013 ($\approx 109,000$ t) remain lower than the estimated MSY values from the 2013 stock assessments ([Table 1](#)). The average catch over the previous five years (2009–13; $\approx 106,000$ t) also remains below the estimated MSY. In 2012 catch levels of bigeye tuna increased markedly ($\approx 26\%$ over values in 2011), but have declined in 2013 by 9% from 2012 levels. Thus, on the weight-of-evidence available in 2014, the bigeye tuna stock is determined to be **not overfished** and is **not subject to overfishing** ([Table 1](#)).

Outlook. Declines in longline effort since 2007, particularly from the Japanese, Taiwan, China and Republic of Korea longline fleets, as well as purse seine effort have lowered the pressure on the Indian Ocean bigeye tuna stock, indicating that current fishing mortality would not reduce the population to an overfished state in the near future. The Kobe strategy matrix based on all plausible model runs from SS3 in 2013 illustrates the levels of risk associated with varying catch levels over time and could be used to inform future management actions ([Table 2](#)). The SS3 projections from the 2013 assessment show that there is a low risk of exceeding MSY-based reference points by 2015 and 2022 if catches are maintained at catch levels of 115,800 t at the time of the last assessment (0% risk that $B_{2022} < B_{MSY}$ and 0% risk that $F_{2022} > F_{MSY}$) ([Table 2](#)).

SPECIES EXECUTIVE SUMMARIES: MANAGEMENT ADVICE

The following key points should be noted:

- **Maximum Sustainable Yield (MSY):** The median value of MSY from the model runs investigated was 132,000 t with a range between 98,000 and 207,000 t (range expressed as the different runs of SS3 done in 2013 using steepness values of 0.7, 0.8 and 0.9; different natural mortality values; and catchability increase for longline CPUE) (see [Table 1](#) for further description). Current stock size is above SB_{MSY} and predicted to increase on the short term. Catches at the level of 132,000 t have a low probability of reducing the stock below SB_{MSY} in the short term (3–5 years) and medium term (10 years). Therefore, the annual catches of bigeye tuna should not exceed the median value of MSY. However, for lower productivity model options, catches at the median MSY level will reduce stock biomass over the long-term (10–15 years). If catch remains below the estimated MSY levels, then immediate management measures are not required. However, continued monitoring and improvement in data collection, reporting and analysis is required to reduce the uncertainty in assessments.
- **Provisional reference points:** Noting that the Commission in 2013 agreed to Resolution 13/10 *on interim target and limit reference points and a decision framework*, the following should be noted:
 - **Fishing mortality:** Current fishing mortality is considered to be below the provisional target reference point of F_{MSY} , and therefore below the provisional limit reference point of $1.4 * F_{MSY}$ ([Fig. 1](#)).
 - **Biomass:** Current spawning biomass is considered to be above the target reference point of SB_{MSY} , and therefore above the limit reference point of $0.4 * SB_{MSY}$ ([Fig. 1](#)).
- **Main fishing gear (2009–13):** Longline $\approx 56.7\%$ (frozen $\approx 43.6\%$, fresh $\approx 13.1\%$); Purse seine $\approx 22.6\%$ (log $\approx 17.5\%$ and free swimming school $\approx 5.1\%$);
- **Main fleets:** Indonesia $\approx 28\%$; Taiwan, China $\approx 25\%$; European Union $\approx 15\%$ (EU, Spain: $\approx 9\%$; EU, France: $\approx 6\%$); Seychelles $\approx 11\%$.

SPECIES EXECUTIVE SUMMARIES: MANAGEMENT ADVICE

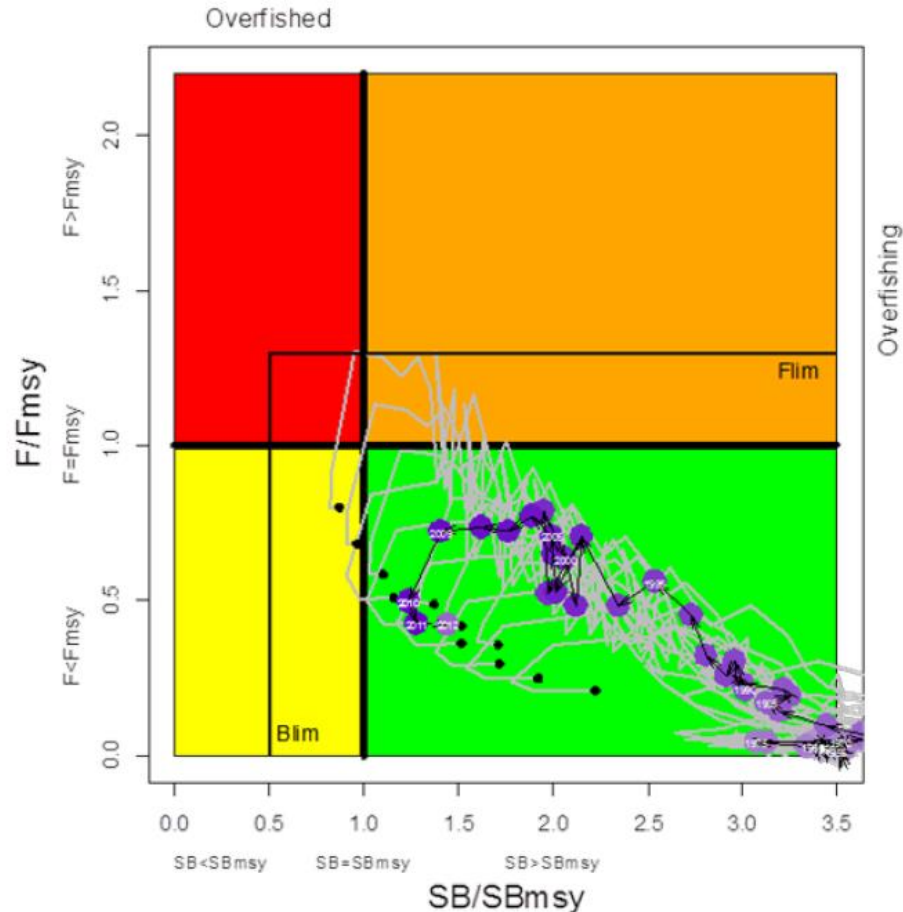


Fig. 1. Bigeye tuna: SS3 Aggregated Indian Ocean assessment Kobe plot. The Kobe plot presents the trajectories for the range of 12 plausible model options included in the formulation of the final management advice (grey lines with the black point representing the terminal year of 2012). The trajectory of the median of the 12 plausible model options (purple points) is also presented. The biomass (B_{lim}) and fishing mortality limit (F_{lim}) reference points are also presented.

SPECIES EXECUTIVE SUMMARIES: MANAGEMENT ADVICE

Table 2. Bigeye tuna: 2013 SS3 aggregated Indian Ocean assessment Kobe II Strategy Matrix. Probability (percentage) of weighted distribution of models violating the MSY-based reference points for five constant catch projections (2012 catch level, $\pm 10\%$, $\pm 20\%$, $\pm 30\%$ and $\pm 40\%$) projected for 3 and 10 years. Note: from the 2013 stock assessment using catch estimates at that time.

Reference point and projection timeframe	Alternative catch projections (relative to the average catch level for 2012) and probability (%) of violating MSY-based target reference points ($SB_{\text{targ}} = SB_{\text{MSY}}$; $F_{\text{targ}} = F_{\text{MSY}}$)									
	60% (69,480 t)	70% (81,060 t)	80% (92,640 t)	90% (104,220 t)	100% (115,800 t)	110% (127,400 t)	120% (139,000 t)	130% (150,500 t)	140% (162,100 t)	
$SB_{2015} < SB_{\text{MSY}}$	n.a.	n.a.	n.a.	n.a.	0	0	0	0	0	
$F_{2015} > F_{\text{MSY}}$	n.a.	n.a.	n.a.	n.a.	0	0	0	8	17	
$SB_{2022} < SB_{\text{MSY}}$	n.a.	n.a.	n.a.	n.a.	0	0	8	17	25	
$F_{2022} > F_{\text{MSY}}$	n.a.	n.a.	n.a.	n.a.	0	0	8	17	25	
Reference point and projection timeframe	Alternative catch projections (relative to the average catch level for 2012) and probability (%) of violating MSY-based limit reference points ($SB_{\text{lim}} = 0.5 SB_{\text{MSY}}$; $F_{\text{Lim}} = 1.3 F_{\text{MSY}}$)									
	60% (69,480 t)	70% (81,060 t)	80% (92,640 t)	90% (104,220 t)	100% (115,800 t)	110% (127,400 t)	120% (139,000 t)	130% (150,500 t)	140% (162,100 t)	
$SB_{2016} < SB_{\text{Lim}}$	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
$F_{2016} > F_{\text{Lim}}$	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
$SB_{2023} < SB_{\text{Lim}}$	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
$F_{2023} > F_{\text{Lim}}$	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	



SPECIES EXECUTIVE SUMMARIES: MANAGEMENT ADVICE

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SPECIES EXECUTIVE SUMMARIES: MANAGEMENT ADVICE

APPENDIX I

SUPPORTING INFORMATION

(Information collated from reports of the Working Party on Tropical Tunas and other sources as cited)

CONSERVATION AND MANAGEMENT MEASURES

Bigeye tuna (*Thunnus obesus*) in the Indian Ocean is currently subject to a number of Conservation and Management Measures adopted by the Commission:

- Resolution 14/02 *for the conservation and management of tropical tunas stocks in the IOTC area of competence.*
- Resolution 14/05 *concerning a record of licensed foreign vessels fishing for IOTC species in the IOTC area of competence and access agreement information*
- Resolution 13/03 *on the recording of catch and effort by fishing vessels in the IOTC area of competence*
- Resolution 13/10 *On interim target and limit reference points and a decision framework*
- Resolution 13/11 *On a ban on discards of bigeye tuna, skipjack tuna, yellowfin tuna and a recommendation for non-targeted species caught by purse seine vessels in the IOTC area of competence*
- Resolution 12/11 *on the implementation of a limitation of fishing capacity of Contracting Parties and Cooperating Non-Contracting Parties*
- Resolution 10/02 *mandatory statistical requirements for IOTC Members and Cooperating non-Contracting Parties (CPC's)*
- Resolution 10/08 *concerning a record of active vessels fishing for tunas and swordfish in the IOTC area*



Recommendation 14/07

Recommendation 14/07 To standardise the presentation of scientific information in the annual scientific committee report and in working party reports

- Stock status
- Model outlooks
- Data quality and limitations of the assessment models
- Alternative approach (data poor stocks)
- Additional information and review of the structure and templates of the '*Executive Summaries*'



SPECIES EXECUTIVE SUMMARIES: MANAGEMENT ADVICE

Discussion:

- How do participants currently use the IOTC Executive Summaries?
- Is the level of detail provided too great, too small or sufficient?
- Suggested alternatives/modifications?



MANAGEMENT ADVICE: Effective Communication

Practical: Small groups

- Take a current Executive Summary and other Advice from the IOTC Working Parties and Scientific Committee, and identify the key elements which you would ensure are communicated to your policy makers.
- Develop a 10 minute briefing highlighting those key elements (ppt template provided).
- Material to be provided for IOTC species (albacore, longtail tuna and striped marlin).
- Consider if a time-area closure is appropriate, among other options and provide evidence on how & why.