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iotc ctoi — **Indian Ocean Tuna Commission / Commission des Thons de l'Océan Indien**

FAO

INDIAN OCEAN TUNA COMMISSION

Working Party on Billfish – 5th meeting

Colombo, Sri Lanka, 27-31 March 2006

DRAFT AGENDA

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1. **REVIEW OF THE DATA**
   - Review of the statistical data available for the billfish species (Secretariat)
2. **NEW INFORMATION ON BIOLOGY, ECOLOGY AND FISHERIES OCEANOGRAPHY RELATING TO BILLFISH**
   - Review new information on the biology, stock structure of billfish, their fisheries and associated environmental data
     Papers as provided by Members

3. **REVIEW OF NEW INFORMATION ON THE STATUS OF BILLFISH**
   - Stock status indicators for marlins, sailfish and swordfish.
     - *Catch and effort*
     - *CPUE*
     - *Changes in fishing area*
     - *Trends in size distributions of the catch*
   - Stock assessments
     - Assessment methods
     - Any new assessments on billfish species
   - Selection of Stock Status indicators and Likely future trends under alternative exploitation scenarios

4. **RESPONSE TO THE REQUEST FROM THE COMMISSION AT S9 IN RELATION TO APPARENT LOCALISED SWORDFISH DEPLETIONS**
   Following the presentation of the 2004 report of the Scientific Committee (IOTC-2004-SC-R) to the Commission at S9, the Commission noted (para 21) the technical recommendations made by the SC regarding the status of the swordfish resource and agreed that the issue of local depletion was were serious and requested the SC to undertake area-specific analyses, with particular emphasis for the southwest Indian Ocean, for the Commission's future consideration.

5. **DEVELOP TECHNICAL ADVICE ON THE STATUS OF THE STOCKS**
     - Marlins and sailfish
     - Swordfish
     - Update of the Executive Summary for Swordfish
6. **RESEARCH RECOMMENDATIONS AND PRIORITIES**

7. **OTHER BUSINESS**
     - *Update: Regional Tuna Tagging Programme – Indian Ocean (Secretariat)*

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CURRENT RESEARCH RECOMMENDATIONS AND PRIORITIES FOR BILLFISH
(FROM IOTC-2004-WPB-R)

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Swordfish stock structure and tagging of swordfish

The WPB considered tagging swordfish as being of key importance to determine realistic hypotheses concerning stock structure. Genetic results are clearly of great interest, but they cannot be used to make realistic hypotheses on movement rates between strata. It was recognized that tagging of swordfish is a difficult and expensive task. However, taking into account the absolute need to validate growth and to determine stock structure, the WPB strongly recommend conducting swordfish tagging in the IOTTP (as was planned in the original IOTTP).

Such tagging could be done in various ways such as: Scientific tagging, primarily with electronic tags, using small rented longliners with short sets of few hooks. Encouraging longline fishermen to tag small swordfish. Such tagging is already conducted in Australia and could be done by observers. .

Swordfish growth

The WPB recommended researchers to try to validate the growth studies already done, and to conduct similar comparative studies in other areas.

Size data analyses

The following additional analyses of Taiwanese size data are recommended:
- Comparison of size frequency distributions for Areas 3 and 7,
- Conversion of lengths to ages using different assumptions on sex ratios at size/age.
- Examination of trends in the 90% quantile for the whole Indian Ocean and specifically for Areas 3 and 7.

Where size data are available for other fisheries the trends in size over time should be similarly examined.

Stock status indicators

Further research is recommended concerning the definition and estimation of stock indicators that reflect the status of stocks of billfish species. Special attention should be given to the choice of indicators which could well measure changes in abundance of older fishes (which are the first to disappear in case of overfishing) and changes in the geographical patterns of the fisheries. The various stock indicators recommended by the WPB in 2001 should be calculated in advance of the WPB meeting in cooperation between scientists from fishing countries and the IOTC Secretariat; and these indicators should be available at the beginning of the WPB meetings.

Analysis of apparent movement of swordfish based on fishery data

The analysis of size specific CPUE by sex and by time and area strata, together with biological data on feeding, sex ratio, reproductive condition etc offer potential to evaluate the apparent movement and stock structure of swordfish. These studies are highly recommended.

Stock assessment – CPUE Standardization:

Following analyses at the 2004 WPB the following further efforts towards standardization of the CPUE series from Taiwanese fleet are recommended, including:
- Improving the definition of variables that could be used as a proxy for targeting.
- Consideration of alternative ways of combining area-specific indices into a global index using different weighting schemes.
- Consideration should be given to defining area strata that take into account environmental factors and fishery distribution and characteristics.

Given the importance of these recommended actions to the swordfish assessment, the WPB encourages a collaborative approach to the work be taken.

- Efforts should be made to provide additional CPUE series from other fisheries (e.g. La Réunion, Seychelles) for the next WPB.
- Stock assessment – Modelling: Ideally, at the next WPB a suite of different types of stock assessment models (including stock production and simple size-based models) should be applied to the available data. The IOTC Secretariat and the WPB Chair should assist in the co-ordination of stock assessment efforts before the next WPB meeting.
- Research on biology of Istiophorids
- The WPB recommended that following research on istiophorids be undertaken.
- Genetic studies of the main istiophorid species, concentrating on obtaining robust sample sizes from widely separated locations in the Indian Ocean. If genetic studies cannot commence in the near future, samples should still be collected and preserved.
- Hard parts from billfish (marlin, sailfish) should be collected and preserved for future age estimation studies. The third (largest) anal spine is probably best for this purpose, but this needs to be verified for each species (with respect to the extent of the matrix in larger fish).
- Popup satellite tagging experiments should be conducted on blue ,black and striped marlins to provide information on many aspects of their biology, including long-term vertical behaviour, movement and mixing rates.
- Increased tagging of billfish in the Indian Ocean should be encouraged on an opportunistic basis. This may be achieved through a coordinated, Indian Ocean wide sport fishery tagging programme, if initiated, as recommended by a recent IOTC consultancy. The forthcoming IOTTP will ensure widespread publicity and offers of rewards for tag returns, enhancing such a sport fishing based tagging programme.
- Improved catch and effort statistics should be collected for artisanal fisheries of coastal countries with the help of IOTC and of the IOTC-OFCF project. This applies to all Istiophorids, but especially sailfish in areas of high recent catches such as Sri Lanka, Iran and Indonesia.
- Selected catch and effort statistics should be collected from key billfish sport fishing areas to provide CPUE indices.
- Selected indicators of stock status should be better identified, selected and prepared before the next WPB meeting and be made available to the WPB allowing to evaluate stocks trends, independently of stock assessments analysis.

For your information 2.

A copy of the most recent *Executive summary of the status of the Indian Ocean swordfish resource* is available from the report of the 8th session of the Scientific Committee (IOTC-2005-SC-R) http://www.iotc.org/English/meetings.php.