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

Report of the 1st Session of the IOTC Working Party on Fishing Capacity

Mombasa, Kenya

22 October, 2009

TABLE OF CONTENTS

1. OPENING OF THE MEETING AND ADOPTION OF THE AGENDA

1. The First Meeting of the Working Party on Fishing Capacity (WPFC) was opened on 22 October 2009 in Mombasa, Kenya, by Dr Hilario Murua (AZTI, Spain), who was elected to chair the Working Party.

2. Dr. Murua welcomed the participants (Appendix I) and the agenda for the Meeting was adopted as presented in Appendix II. The list of the documents presented to the meeting is given in Appendix III.

3. The Chair noted that the Terms of Reference (Appendix IV) for the current meeting were rather ambitious, but that an attempt should be made to answer the key questions posed by the Commission.

2. BACKGROUND INFORMATION ON FISHING CAPACITY IN THE IOTC CONTEXT

4. The Secretariat presented a brief summary of the history of fishing capacity management within the IOTC while also providing the rationale and need for this working group.

5. The Secretariat informed about several Resolutions calling for countries to limit fishing capacity at certain levels pertaining to particular years. For example, Resolution (03/01) *On the limitation of fishing capacity of Contracting Parties and Cooperating Non-Contracting Parties*; Resolution (06/05) *On the limitation of fishing capacity, in terms of number of vessels, of IOTC Contracting Parties and Co-operating Non Contracting Parties* for tropical tunas, Resolution 07/05 *Limitation of fishing capacity of IOTC Contracting Parties and Cooperating Non-contracting Parties in terms of number of longline vessels targeting swordfish and albacore,* and Resolution (09/02) *On the implementation of a limitation of fishing capacity of Contracting Parties and Cooperating Non-Contracting Parties* which superseded Resolutions 06/05 and 07/05.

6. In 2008, the Commission, noting that no estimates of overall fishing capacity were currently available, requested, in paragraph 26 of the report of the Session, *"the Scientific Committee to address this matter as soon as possible.… …so that estimates of fishing capacity for the Indian Ocean are available at the next session."*

7. In light of the above request, the SC recommended that a Working Party on fishing capacity be established to cover the issue of fishing capacity in the IOTC Convention Area. To this end, the SC drafted terms of reference for this Working Party which were agreed upon by the Commission in its 2009 Session (Appendix IV). It was emphasized that the Working Party was established at the request of the Commission to answer technical questions regarding the estimation of fishing capacity including a revision of methods available to conduct such estimation.

3. REVIEW OF METHODS TO ESTIMATE AND MANAGE FISHING CAPACITY

8. A review of the ICCAT experience on tuna fishing capacity assessment and management was presented in document IOTC-2009-WPFC-Info2.

9. Presentation IOTC-2009-WPFC-Info2 described the documentation and experience available within ICCAT in relation to techniques for assessing fishing capacity such as Data Envelopment Analysis (DEA), Peak-to-peak Analysis, or Stochastic Production Frontier (SPF) analysis; an overview of the ICCAT experience estimating capacity; and the ICCAT approach to managing fishing capacity. The conclusions from ICCAT are that capacity analysis and management is a complex issue. Addressing fishing capacity (overcapacity) requires more than simply limiting the number of vessels with access to the fishery. In order to consider the issues, detailed information is needed on both the resources and their characteristics, and the number and characteristics of all vessels in all categories that are exploiting tuna resources. However, ICCAT Working Group on Stock Assessment Methods (WGSAM) concluded that fishing mortality (F) to F_{MSY} (fishing mortality corresponding to MSY) ratio, often used to assess the status of stocks, may be a good proxy to assess overcapacity. Similarly, they concluded that input-based fishing capacity measures may be more easily translated into management measures than those which utilize output-based measures of capacity.

10. The group agreed that ICCAT had undertaken several sensible initiatives to address the issue of capacity estimation, and that this could be the model followed in the IOTC with modifications to address issues specific to the IOTC region.

11. A brief discussion of approaches followed in other tuna RFMOs (IATTC and WCPFC) followed ICCAT discussion. In the western and central Pacific, the emphasis has been on limiting fishing effort, as the Pacific Island nations have collectively implemented a limit on the total number of days fished by the industrial purse-seine fleet, including domestic and distant-water fleets. The total number of fishing days is allocated between

countries based on the recent distribution of fishing effort and the spatial distribution of the biomass of skipjack and yellowfin tuna. Each country has the responsibility of ensuring that the level of fishing effort within its EEZ does not exceed the allocated number of fishing days. The WCPFC has adopted a compatible measure for the purse seine fishing within the areas of international waters. In these areas, individual flagged states are required to ensure the level of fishing effort by their purse-seine fleet does not exceed the level of fishing effort in a reference period.

12. The group was also informed that, although some WCPFC members have recommended to promote research on the effects of changes in fishing power of individual vessels, other members have questioned the necessity to carry out this type of evaluation.

13. The IATTC have adopted a target of maximum carrying capacity for purse seiners to determine an acceptable level of fishing capacity; with the aim to keep it at a level that could take the maximum harvest from the fishery while at the same time ensuring the sustainability of each stock. Similarly, a target effort of maximum number of hooks (about the level of 2001-2002) for the longline fleet was suggested. Although both measures could be insufficient, as they do not account for increases in fishing efficiency; they could be effective if used in conjunction with other measures which effectively cap effort in the region, as IATTC seasonal and area closures.

14. It was pointed out that despite significant work having been carried out on estimating existing fishing capacity in tuna RFMOs, these estimates had yet to be directly used in management advice in a meaningful way. It was discussed at some length that in most commissions, including IOTC, optimal levels of fishing mortality (F) are commonly being calculated, but that the relationship between F and effective effort or fishing capacity is difficult to define. In other words, there is no clear way to relate a given fishing mortality to an effort restriction or a fishing capacity limit (i.e. Number of fishing vessels, fishing days, or vessel capacity).

15. The group also questioned the usefulness of using output-based measures of fishing capacity. Although these measures are useful under certain situations, e.g. to assess the maximum production potential for an industrial facility, they estimate the maximum output that a fishery may have under ideal conditions. These measures are thus problematic for use in the management of tuna fleets as the estimates may be obtained in anomalous years and therefore they do not reflect average conditions. The group agreed that input-based measures of fishing capacity are far more useful for management purposes.

4. PRELIMINARY ESTIMATION OF THE FISHING CAPACITY OF THE TUNA FLEETS IN THE INDIAN OCEAN

16. The IOTC Secretariat presented the preliminary results of a report containing estimates of "Input fishing capacity of vessels fishing for tropical tunas, albacore and swordfish in the IOTC Area of Competence" (IOTC-2009-WPFC-03). For the purpose of this study, the following definitions were used:

- Input Fishing Capacity is the amount of fishing units/fishing effort devoted to catch a given resource over a period of time (e.g. a year or a fishing season).
- Output Fishing Capacity is the maximum amount of fish (or fishing effort) that can be produced over a period of time (e.g. a year or a fishing season) by a vessel or a fleet if fully utilized and for a given resource condition

17. The Secretariat informed the WP that the capacity study had been requested by the Commission in 2006 and had been conducted using extra-budgetary funds, that the Government of Australia had allocated to this purpose (30,000 US$). The Terms of Reference for the Capacity study, prepared by Australia and the IOTC Secretariat, are presented in Appendix V. A consultant, Mr Robert Gillet, was hired in July 2009 to work in the preparation of the report, in conjunction with the IOTC Secretariat. Mr Gillet has extensive experience in fishing capacity, having participated to numerous initiatives relating to this issue, in particular the preparation of a report on fishing capacity for the fleets operating in the WCPFC region. The IOTC Secretariat further informed that the report was being finalized and will be available before the end of 2009, to be made available for the next Commission meeting, in March 2010.

18. The IOTC Secretariat indicated that the main objective of the study was the estimation of input fishing capacity, in terms of numbers of vessels fishing for tropical tunas, albacore, or swordfish, for the fleets that operated in the Indian Ocean during the years 2006, 2007 and 2008, including:

- All vessels having LOA[1] 24m or greater (large-scale vessels[2])

[1] LOA: Length overall

- Vessels having LOA less than 24m (medium-scale vessels[3]) that operate beyond the EEZ[4] of their flag countries

19. In addition, the study looked into the following issues:

- Availability and quality of the data used for the estimation of input fishing capacity
- Availability of catch data for the vessels included in the study
- Importance of fisheries not accounted for in the study, in particular small-scale[5] fisheries and medium-scale fisheries operated within the EEZ of their flag countries.
- Potential effects that changes in targeting practices or fishing efficiency may have over estimates of fishing capacity
- Usefulness of output-based estimates of fishing capacity for tuna fisheries, data needs and current limitations

20. The IOTC Secretariat pointed out that the following datasets had been used to estimate input fishing capacity in the Indian Ocean:

- Lists of vessels actively fishing for tropical tunas, albacore or swordfish reported by IOTC CPC's[6] in 2006-2008, by flag country, vessel length category, and year, including:
    i. Lists of active vessels reported by CPC's as requested in IOTC Resolution 07/04, including:
        1. Large-scale fishing vessels (LOA 24m or greater) that operated in the Indian Ocean during the year concerned
        2. Medium-scale (LOA less than 24m) fishing vessels under its flag that operated fully or partially outside its EEZ during the year concerned
        3. All foreign vessels, irrespective of its size, that had a license to operate within its EEZ during the year concerned
    ii. Reports from CPC's including lists of foreign fishing vessels that unloaded catches within its territory during the year concerned, as requested in IOTC Resolution 05/03.
- Vessels in the IOTC Record of Authorized Vessels, as reported by CPC's in accordance with IOTC Resolution 07/02, including:
    i. All large scale fishing vessels (LOA 24m or greater)
    ii. Those medium scale fishing vessels (LOA less than 24m) that operated fully or partially outside its EEZ.
- Lists of foreign fishing vessels provided voluntarily by non-CPC's
- Vessels in the IOTC IUU list
- Numbers of vessels fishing for IOTC species reported by IOTC CPC's or other countries (fishing craft statistics)

21. In addition, the report presents catches of tropical tunas, albacore and swordfish for the fleets included in the study and catches for other fleets for which input fishing capacity was not estimated.

22. The study indicated that the input capacity estimated for 2006-08 was around 9,000 fishing vessels. However, it was noted that, at the time of the study, Sri Lanka, Pakistan and Maldives had not provided active vessel lists, and, therefore, the numbers of vessels estimated, amounting to around 6,000 vessels, represented the total number of vessels operated in each case, irrespective of vessel size and area of operation. It was further noted that the number of such vessels that actually operated beyond the EEZ of their flag countries during 2006-8 is thought to be low. The fleets referred to above are covered below:

[2] Large scale vessel: tuna fishing vessels which usually have mechanical freezing and which are 24m or longer

[3] Medium scale vessel: tuna fishing decked vessels usually without mechanical freezing which are mainly between 12 and 24 m

[4] EEZ: Economic Exclusive Zone

[5] Small scale fisheries: handlining, trolling from open fishing vessels, rod/reel fishing, sport fishing, and all kinds of tuna fishing from vessels usually under 12 m which are undecked, un-powered, or use outboard engines or sail

[6] CPC: IOTC Contracting Parties and Co-operating Non-contracting Parties

- 2,300-2,800 medium-scale fishing vessels from Sri Lanka: these vessels use a combination of gillnet and longline and usually operate within the EEZ of Sri Lanka. Although the Secretariat received reports from third parties concerning sightings of several Sri Lankan vessels fishing outside the EEZ of Sri Lanka, the number of vessels that operate outside the EEZ is unknown.
- Around 2,300 fishing vessels from Pakistan: these vessels use gillnets and usually operate within the EEZ of Pakistan. However, some of the vessels are thought to be large-scale gillnetters (LOA 24m or greater) and a significant proportion of the medium-scale vessels is thought to be operating beyond the EEZ of Pakistan, mainly in the Arabian Sea.
- Around 900 vessels from Maldives: these vessels use pole-and-lines and, to a lesser extent, handlines and operate within the EEZ of Maldives. Although some of the vessels are known to be large-scale fishing vessels (LOA 24m or greater), it is thought that this component does not represent a large proportion of the fleet.

23. Reports submitted by third parties included about 40 vessels that had not been reported by their flag countries. However, it was noted that the number of such vessels remains uncertain, as some coastal countries in the IOTC Region do not report lists of foreign vessels to the Secretariat.

24. In addition, the study also identified the following issues related to the estimation of input fishing capacity:

- Parties have not provided sufficient information to classify vessels into the categories adopted in the study. For example, Indonesia did not report length overall for a large proportion of its vessels; Indonesia, India and Oman did not indicate which of their medium-scale vessels operated beyond their EEZ.
- Classifying fishing capacity according to the species targeted is difficult as the target species was not declared for as much as 98% of the vessels in the study.

25. The study also indicated that some of the countries for which input fishing capacity had been estimated had not reported catches for its vessels (India) or the catches had not been reported by vessel length category (Indonesia, Iran, Malaysia).

26. Overall, the catches of tropical tunas, albacore and swordfish estimated for fleets that were not included in the capacity study amounted to as much as 14% of the total catches of these species in the Indian Ocean. Small-scale fishing vessels using gillnets, hand lines and troll lines are responsible for the majority of these catches.

27. Concerning the effect that changes in targeting practices may have on estimates of fishing capacity, the study noted that most tuna fisheries are of multi-species nature and, in addition, changes in target species may occur often, being especially the case with longline fisheries.

28. Finally, the study does not include an estimation of output fishing capacity due to the following reasons:

- The use of output-based measures of fishing capacity, as they are based on the output under ideal conditions experienced by the fishery and not to average conditions, are not practical as a management tool.
- The estimation of output capacity requires more detailed information on the levels of activity of the fleets involved than is currently available.

29. The group acknowledged and thanked the considerable amount of work and valuable contribution of the project towards estimating capacity in the Indian Ocean region.

30. Based on the study presented, the WP noted that improvements in certain areas are required in order to obtain more precise estimates of input fishing capacity, in particular:

- **Pakistan**, **Sri Lanka** and **Maldives** providing lists of active vessels, including information about medium-scale vessels (<24m) that operate outside its EEZ;
- **India** providing a complete list of active vessels under its flag;
- **Indonesia** identifying which of its medium scale vessels (<24m) operate outside its EEZ:
- **Indonesia** to verify vessel-tonnage measurements and to provide length measurements for all of its vessels;
- All countries having large- and medium-scale vessels to provide separate catches by vessel size class, in particular **Indonesia, Iran, India** and **Malaysia.**

31. The question was raised as to whether the study should have included fishing boats under 24 m[7] which operated exclusively inside the EEZ of participating countries in order to get an even clearer picture of capacity in the region. It was agreed that this was indeed important, but the incorporation of these vessels was beyond the resources and time of the study. The catches of these fleets are included in the IOTC database, but associating those catches with number of vessels is beyond the scope of the current study. The multi-species nature of these fleets also renders estimates of tuna-directed capacity very difficult to assess. However, the group agreed that to understand the total fishing pressure directed at tuna resources, estimates of fishing capacity should include consideration of these fleets.

32. The WP also agreed that the use of only two vessel-length categories to assess input capacity, less than 24m and 24m or greater, may be insufficient, recommending that the use of narrower vessel length categories be assessed for future estimates of input capacity.

33. The WP also noted that potential effects that changes in levels of activity, targeting practices, gear selectivity, fishing efficiency improvements, multispecies nature of most fisheries, and multi gear fisheries exploiting the same resources may have over capacity estimations should be taken into account.

5. MAIN NEEDS FOR ESTIMATION OF FISHING CAPACITY

34. The WPFC agreed that, in order for the estimates of fishing capacity in the IOTC Area to be useful in a management context, the following information is required:

- Detailed information on the fleets for which fishing capacity is to be estimated, in particular vessel unique identification, vessel length and gross tonnage, levels of activity and gear used for each individual vessel for the fleets under consideration, and target species.
- Estimates of optimum fishing mortality and a procedure to relate fishing capacity and fishing mortality.
- Estimating the effects that the fleets not accounted for may have on future estimates of fishing capacity.
- Estimating the effects that changes in the efficiency of individual vessels/fleets, over individual species or as a whole, may have on future estimates of fishing capacity.

These issues are discussed in the following paragraphs.

35. The use of effort-based (as opposed to catch-based) controls such as fishing capacity limits for management purposes is more complex than limiting the number of vessels that are able to access the fishery. Its success depends on the ability to translate the fishing mortality estimates derived from the stock assessments into an optimal fishing capacity, measured in tonnage, number of vessels or some measure of fishing effort. For example, in order to translate effectively a quantity such as Fmsy into an optimal total tonnage or number of boats, accurate information is required about number of boats, size and other characteristics of the boats, levels of activity by vessel, efficiency, etc.. The difficulty is compounded due to the ability of fleets to migrate between oceans, the multispecies nature of the fisheries, increase of efficiency, targeting issues, etc. If that information is not available, estimation of fishing capacity is still possible, but less effective as a management tool, as there will be more uncertainty in the relationship between a recommended fishing capacity and the optimal level of fishing mortality.

36. The WP noted that addressing the problems described in the previous section would improve greatly current estimates of fishing capacity in the IOTC Area. However, to better understand future evolution of fishing capacity, special attention should be given to investigate changes in fishing efficiency of the different fleets, along the lines of existing initiatives (e.g. working group on fishing technology of the WCPFC or in CLIOTOP).

37. Therefore, the WPFC recommended that methods to investigate input-based capacity measures should be developed in conjunction with the work carried out in other tuna RFMOs and that close collaboration should be pursued with these organisations in this area. Especially, in developing methods to relate fishing mortality levels and the effective effort measures which will be of great help in the process of producing management advice in terms of fishing capacity limits.

38. In conclusion, the WPFC noted that, since the first request for advice from the Commission, as discussed in the report of the WPTT in 2000, there have been many advances that allowed for a preliminary estimation of

[7] This refers to mechanized vessels having inboard engines only.

current fishing capacity to be carried out. In particular, information about active fishing fleets is much better than what it was at the time. Nevertheless, due to the complexities of the fishing fleets (increases in fishing power, shifting targeting practices, multispecies fisheries) the estimation of optimal fishing capacity is still difficult and further work will be needed. Therefore, at this stage the group is unable to provide advice on optimal levels of fishing capacity as requested by the Commission.

6. RECOMMENDATIONS AND PRIORITIES

GENERAL
The WPFC agreed that ICCAT had undertaken several sensible initiatives to address the issue of capacity estimation, and that this could be the model followed in the IOTC with modifications to address issues specific to the IOTC region (paragraph 10).
The WPFC agreed that input-based measures of fishing capacity are far more useful for management purposes (paragraph 15).
DATA
The WPFC noted that improvements in certain areas are required in order to obtain more precise estimates of input fishing capacity, in particular (paragraph 30): • Pakistan, Sri Lanka and Maldives providing lists of active vessels, including information about medium-scale vessels (<24m) that operate outside its EEZ; • India providing a complete list of active vessels under its flag; • Indonesia identifying which of its medium scale vessels (<24m) operate outside its EEZ: • Indonesia to verify vessel-tonnage measurements and to provide length measurements for all of its vessels; • All countries having large- and medium-scale vessels to provide separate catches by vessel size class, in particular Indonesia, Iran, India and Malaysia.
The WPFC agreed that to understand the total fishing pressure directed at tuna resources, estimates of fishing capacity should include consideration of the fishing boats under 24 m which operated exclusively inside the EEZ of participating countries fleets (paragraph 31).
The WPFC agreed that the use of only two vessel-length categories to assess input capacity, less than 24m and 24m or greater, may be insufficient recommending that the use of narrower vessel length categories be assessed for future estimates of input capacity (paragraph 32).
The WPFC agreed that, in order for the estimates of fishing capacity in the IOTC Area to be useful in a management context, the following information is required: Detailed information on the fleets for which fishing capacity is to be estimated, in particular vessel unique identification, vessel length and gross tonnage, levels of activity and gear used for each individual vessel for the fleets under consideration, and target species (Paragraph 34).
The WPFC noted that to better understand future evolution of fishing capacity special attention should be given to investigate changes in fishing efficiency of the different fleets, along the lines of existing initiatives (e.g. working group on fishing technology of the WCPFC or in CLIOTOP) (paragraph 36).
METHODS
The WPFC recommended that methods to investigate input-based capacity measures should be developed in conjunction with the work carried out in other tuna RFMOs and that close collaboration should be pursued with these organisations in this area. Especially, in developing methods to relate fishing mortality levels and the effective effort measures which will be of great help in the process of producing management advice in terms of fishing capacity limits (paragraph 37).

7. OTHER BUSINESS

39. There being no other matters, the Chair closed the meeting by thanking the participants for their contributions and co-operation, the rapporteur for taking the minutes, and the IOTC Secretariat for their assistance.

8. ADOPTION OF THE REPORT

40. The Report of the First Session of the Working Party on Fishing Capacity was adopted by correspondence on the 13th November 2009

APPENDIX I
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APPENDIX II
AGENDA OF THE MEETING

1. ELECTION OF THE CHAIRMAN

2. BACKGROUND INFORMATION ON FISHING CAPACITY IN THE IOTC CONTEXT

3. REVIEW OF METHODS TO ESTIMATE AND MANAGE FISHING CAPACITY
- FAO Technical Advisory Committee on Tuna Fishing Capacity
- other RFMOs, national management bodies, and other institutions

4. PRELIMINARY ESTIMATION OF THE FISHING CAPACITY OF THE TUNA FLEETS IN THE INDIAN OCEAN (IOTC-2009-WPFC-03)

5. MAIN NEEDS FOR ESTIMATION OF FISHING CAPACITY
- Review of available data
- Review any additional data needed

6. RECOMMENDATIONS AND PRIORITIES

7. OTHER BUSINESS

APPENDIX III
LIST OF DOCUMENTS PRESENTED TO THE MEETING

Document	Title
IOTC-2009-WPFC-01	Draft agenda of the Working Party on Fishing Capacity
IOTC-2009- WPFC-02	WPFC List of documents
IOTC-2009-WPFC-03 (pres)	Estimation of the fishing capacity of the tuna fleets in the Indian Ocean
IOTC-2009-WPFC-Inf01	Using stock assessment information to assess fishing capacity of tuna fisheries. *H. Arrizabalaga, V.R. Restrepo, M.N. Maunder and J. Majkowski.*
IOTC-2009-WPFC-Inf02	A review of the ICCAT experience on tuna fishing capacity assessment and management *H. Murua, P. de Bruyn and H. Arrizabalaga*
IOTC-2009-WPFC-Inf04	FAO Methodological WS 2006 La Joya.
IOTC-2009-WPFC-Inf05	Measuring fishing capacity in tuna fisheries. *C. Reid*
IOTC-2009-WPFC-Inf06	Relating estimates of fishing capacity from DEA to traditional measures of fishing capacity. *D. Squires*
IOTC-2009-WPFC-Inf07	Report of the Second Meeting of the TAC Madrid 2004.
IOTC-2009-WPFC-Inf08	FAO IPOA Capacity
IOTC-2009-WPFC-Inf09	A Framework for Assessing Capacity In Fisheries When Data are Limited. *R. Färe, S. Grosskopf, J.E. Kirkley, D. Squires.*
IOTC-2009-WPFC-Inf10	Requirements and alternatives for the limitation of fishing capacity in tuna purse seine fleets. *J.Joseph*

APPENDIX IV
TERMS OF REFERENCE FOR A WORKING PARTY ON FISHING CAPACITY

Background

The Commission has requested information on fishing capacity within the IOTC area in order to inform its management decisions.

Capacity analysis must be linked to policy needs. It must be set in context:

Globally overcapacity exists relative to tuna fishery resources. It is a global problem that requires a coordinated global response. Nevertheless there are issues that IOTC can examine 'locally':

- The fisheries are multispecies for tunas and tuna like species though some targeting is possible and therefore target switching can complicate evaluation of fishing capacity.
- It is a multi-gear fishery with vessels of different characteristics (purse seine +/- FADS; longlines; pole and line, multi-gear artisanal fisheries); increases in fishing power can occur over time with technological development.
- In the IOTC area artisanal fisheries are a particular factor that needs to be considered. They account for about half the catch.

Terms of Reference:

The Working Party on Fishing Capacity is expected to undertake the following work over several years. This working party shall not only focus on estimation of fishing capacity. It should also provide information that will enable the implementation of capacity controls by IOTC.

1) Review methods reviewed by the FAO Technical Advisory Committee on Tuna Fishing Capacity and by other RFMOs, national management bodies, and other institutions to estimate and manage fishing capacity;
2) Investigate the most suitable methods currently available to determine fishing capacity that can be applied in the Indian Ocean. Review any additional data requirements to apply those methods in IOTC;
3) Define the factors affecting fishing capacity that can be managed by IOTC;
4) Determine the fishing capacity of the existing tuna fishing fleets relative to the status of the resources;
5) Determine the relative fishing capacities of different vessel/gears categories.

APPENDIX V
TERMS FOR REFERENCE FOR AN INDEPENDENT REPORT ON FISHING CAPACITY IN THE INDIAN OCEAN

Objective:

To investigate and report on the level and type of regulated and unregulated fishing capacity within the IOTC Convention Area, including the activities of Contracting Parties and Cooperating non-Contracting Parties (CPCs) and Non Contracting Parties NCPCs and the catching capacity of their vessels.

The study should include:

1. A background review of the concept of "fishing capacity"

2. A detailed account of the current level of active fishing capacity for each State or fishing entity within the IOTC Convention Area by:
    a. IOTC member status (CPCs, non-CPCs, IUU fishing)
    b. Type of fleet (large-scale, medium-scale, small-scale)
    c. Fishing method (purse seining, longlining, etc);
    d. Analyse the possible transfer between species of fishing capacity through changes in targeting practices.

It is intended that in conducting this work the consultant will utilise the IOTC databases, input from CPCs, NCPCs, International Organisations and non-Government Organisations, working in cooperation with the IOTC Secretariat as necessary.

The conclusions of the study should include:

1. Recommendations to the IOTC on improving data management with regard to monitoring capacity in the Indian Ocean.
2. An assessment of the areas that should be prioritised for the IOTC to ensure a sustainable level of fishing capacity in the Indian Ocean.