

**Report of the**

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**TECHNICAL WORKSHOP ON THE STATUS, LIMITATIONS AND  
OPPORTUNITIES FOR IMPROVING THE MONITORING OF SHARK  
FISHERIES AND TRADE**

**Rome, 3–6 November 2008**



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ISBN 978-92-5-106435-1

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## **PREPARATION OF THIS DOCUMENT**

This report documents the discussions and conclusions of the Technical Workshop that was held to evaluate the current limitations in the monitoring of shark fisheries and the trade in shark products and to recommend strategies for improving the situation. The Technical Workshop was held in Rome from 3 to 6 November 2008 and was funded by the Japan-funded Trust Fund Project on “CITES and commercially-exploited aquatic species, including the evaluation of listing proposals”.

FAO.

Report of the Technical Workshop on the Status, Limitations and Opportunities for Improving the Monitoring of Shark Fisheries and Trade. Rome, 3–6 November 2008.

*FAO Fisheries and Aquaculture Report*. No. 897. Rome, FAO. 2009. 152p.

### **ABSTRACT**

The Technical Workshop on the Status, Limitations and Opportunities for Improving the Monitoring of Shark Fisheries and Trade considered global and country specific information on shark fisheries and trade to identify limitations and strategies for improving their monitoring. Reports from a selected number of main shark fishing and trading nations described the status of shark fisheries and the efforts towards the development of a National Plan of Action for Sharks. The workshop recommended actions to promote the implementation of National Plans of Action for Sharks and to address specific problems affecting catch and trade monitoring, including lack specificity in data, underestimated catch volumes, and limitations in the customs codes used in trade monitoring.

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## BACKGROUND AND OBJECTIVES OF THE WORKSHOP

Concerns about the expanding catches of sharks<sup>1</sup> and their potential negative impacts on shark populations have led to an increased level of international attention to the management of shark fisheries, particularly during the last decade. FAO developed the International Plan of Action for Conservation and Management of Sharks (IPOA–Sharks) in 1999 with the objective to ensure the conservation and long-term sustainable use of sharks, including species that are target and non-target of fisheries. Central to the objective of the IPOA–Sharks is the effective implementation of National Plans of Action by States which conduct direct fisheries for sharks or that regularly catch sharks in non-directed fisheries.

In 2005, FAO organized an Expert Consultation<sup>2</sup> that evaluated progress in the implementation of the IPOA–Sharks. The consultation concluded that few countries had had a successful record of conservation and management of elasmobranch resources and that the problem of depleted and threatened stocks and species continued to increase. A number of possible reasons for that were identified, including:

- the low economic importance of shark fisheries in many countries, and the correspondingly low priority they receive in the allocation of management resources (funds and experts);
- the weak or lack of political will to address the problems of elasmobranch population within management jurisdictions;
- the lack of expertise needed to determine which management actions are required and to rank their importance and expedite their implementation;
- insufficient funding and/or human resources to address the problems posed by the management requirements of national elasmobranch resources;
- the dependency of national initiatives on funds provided by donors.

Other particular concerns identified as factors hampering the implementation of effective management of elasmobranch fisheries included:

- the lack of appropriate taxonomic guides to identify species;
- the lack or insufficient information on the population biology of elasmobranch species, both targeted and bycatch species;
- scarce or lacking data, particularly for catch and fishing effort, to inform management decision making.

The twenty-seventh session of COFI in 2007 concurred that despite efforts by some countries to implement the IPOA–Sharks, further intensive work was required. The most recent information available to FAO at the live of the workshop indicated that of the 31 top shark fishing nations (accounting for 90 percent of world elasmobranch catches) only ten had developed National Plans of Action for Sharks.

International trade in shark products (including fins and meat) has been recognized as a major driver for the exploitation of some shark species. Increased concerns about the threatened status of shark species targeted for international trade has led to proposals for listing shark species in the Appendices of CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora). The whale shark, *Rhincodon typus*, and the basking shark, *Cetorhinus maximus*, were included in CITES Appendix II (controlled trade) in 2002. The white shark, *Carcharodon carcharias*, was included in CITES Appendix II in 2004. All species of sawfishes (Family Pristidae) were included in CITES Appendix I (no trade allowed) in 2007.<sup>3</sup> In addition, two proposals concerning important commercially-exploited sharks (*Squalus acanthias* and *Lamna nasus*) were proposed but rejected by CITES Parties in 2007.

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<sup>1</sup> For the purposes of this document, the term “shark” is taken to include all species of sharks, skates, rays and chimaeras (class Chondrichthyes).

<sup>2</sup> FAO. 2006. Report of the FAO Expert Consultation on the Implementation of the FAO International Plan of Action for the Conservation and Management of Sharks. Rome, 6–8 December 2005. FAO Fisheries Report. No. 795. FAO, Rome. 24p.

<sup>3</sup> The only exception being *Pristis microdon*, listed in Appendix II.

Informed by the results of the FAO Expert Consultation, and based on the work of the Sharks Working Group of the CITES Animals Committee, the Animals Committee elaborated draft decisions concerning future activities of CITES on sharks which were revised and adopted at the fourteenth Meeting of the Conference of the Parties (The Hague, June 2007). With regards to the IPOA–Sharks,<sup>4</sup> Parties were strongly encouraged to identify opportunities to:

- improve, in cooperation with FAO and relevant fishery management bodies, the monitoring and reporting of catch, bycatch, discards, market and international trade data, at the species level where possible;
- establish systems to provide verification of catch information; and
- implement the FAO IPOA–Sharks as a matter of priority, where they have not done so.

In addition, Parties that are members of a regional fishery management organization were strongly encouraged to request through FAO and regional fishing management organizations, where appropriate, that these organizations develop and implement regional shark plans and associated measures to assist in species identification and monitoring, as called for in the IPOA–Sharks, by mid-2009 in order to report at the fifteenth meeting of the Conference of Parties.

### ***The need for improving information on shark fisheries and trade***

One of the primary goals of quantifying the volume of species of fish taken in commercial fishing activities is to obtain the information required to develop and monitor the implementation of fishery management plans. Information about the status of commercially-harvested species provides an important indicator of the sustainability of a fishery. This information can come from different sources, including the monitoring of the fishing activity (e.g. landing, catch and effort data), biological surveys and information from resource users. Often the only data available to infer the status of a fishery resource in a particular location are the landings or catches in weight or number of the targeted species.

It has been noted that while there are major concerns about the conservation, species diversity and the potential local extinction of shark species, the quality of the landings statistics in many countries is insufficient to confidently monitor or measure changes in taxonomic composition of the catch at an appropriate level.<sup>5,6</sup> According to the 2006 data compiled by FAO from country submissions and other sources, only approximately 30 percent of the world shark catches are reported at the species or genus level and another 13 percent at the family level.

Illegal, unreported and unregulated (IUU) fishing further complicates the ability of States to properly monitor the status of shark resources. A recent analysis of the global shark fin trade indicated, for instance, that the estimated shark biomass in the fin trade can be three to four times higher than shark catch figures reported in FAO fisheries statistics database.<sup>7</sup> The difference may be attributable to factors such as unrecorded shark landings, shark catches recorded in non-chondrichthyan-specific categories (e.g. marine fish nei), and/or a high frequency of shark finning and carcass disposal at sea, a practice that is prohibited in several countries and regional fisheries management organizations (RFMOs).

Considering the importance of international trade as a driver for the exploitation of many shark species, accurate information on the volume of trade in shark products is also crucial to determine the relative importance of trade as a threat to sharks species and to examine the potential role of trade regulation (e.g. CITES) as a complementary measure for the conservation and sustainable use of sharks. In cases where species are mainly harvested for international trade, trade volumes can also be an auxiliary indicator of the scale of shark catches. Estimating the volume and trend of international trade in shark species is complicated by different factors, such as discrepancies between data sources (e.g. production, exports and imports), lack

<sup>4</sup> Decisions 14.115 and 14.116 (available at [www.cites.org/eng/dec/valid14/14\\_101-117.shtml](http://www.cites.org/eng/dec/valid14/14_101-117.shtml)).

<sup>5</sup> Shotton, R. (ed.). 1999. Case studies on the management of elasmobranch fisheries. FAO Fisheries Technical Paper. 378/1. Rome. FAO.

<sup>6</sup> FAO. 2006. FAO Expert Consultation on the Implementation of the FAO International Plan of Action for the Conservation and Management of Sharks. Rome, 6–8 December 2005. FAO Fisheries Report. No. 795. Rome, FAO. 24p.

<sup>7</sup> Clarke *et al.* 2006. Global estimates of shark catches using trade records from commercial markets. *Ecology Letters* 9: 1115–1126.

of accuracy and species breakdown of reporting, and most importantly, by the lack of species-specific reporting codes.

It is clear that the improvement of the monitoring of shark fisheries and trade can make a considerable contribution to the successful implementation of national, regional and international efforts to promote shark conservation and sustainable use.

The Technical Workshop on Status, Limitations and Opportunities for Improving the Monitoring of Shark Fisheries and Trade was held at FAO headquarters in Rome, from 3 to 6 November 2008, with the objective to obtain a better understanding of the current situation and the limitations in the monitoring of shark fisheries and trade in selected fishing nations, and based on that, to identify opportunities for future improvement. The workshop was sponsored by the Japan-funded Project on “CITES and commercially-exploited aquatic species including the evaluation of listing proposals”.

## **PARTICIPATING COUNTRIES**

Fisheries experts from a selected number of countries were invited to participate in the workshop. Countries were selected based on their importance as the main shark fishing or trading nations, the level of development of NPOA–sharks and geographical representation. Participants from Argentina, China, Hong Kong Special Administrative Region (China, Hong Kong SAR), Ghana, Indonesia, Iran (Islamic Republic of), Italy, Japan, Panama, Senegal, Spain, Sri Lanka and the United States of America attended the workshop. Although participants from Nigeria, Pakistan and Singapore confirmed their attendance, they were unable to attend due to reasons beyond their control.

In addition, the workshop was attended by representatives of the Permanent Secretariat of the Subregional Fisheries Commission (SRFC), CITES Secretariat, World Wide Fund for Nature (WWF) and Traffic International. The list of participants can be found in Appendix 2.

## **OPENING**

Mr Ichiro Nomura, Assistant Director-General, FAO Fisheries and Aquaculture Department, and Dr K. Cochrane, Chief, FAO Fisheries Management and Conservation Service, welcomed participants to FAO headquarters and stressed the importance of the meeting in identifying a strategy to improve the information on the catches of sharks and on the trade in shark products. It was noted that such improvement was essential to the successful implementation of the IPOA–Sharks and of other instruments aimed at the conservation and management of sharks. It was also noted that despite the progress in the implementation of NPOAs made in recent years by some countries, intensive work was still required to improve the overall level of implementation of the programme. The technical workshop was viewed as an important step towards this goal. The text of Mr Nomura’s statement is reproduced in Appendix 3.

Mr John Carlson was elected Chair of the workshop and Mr Hideki Moronuki was elected Vice-Chair. The adopted agenda of the meeting is reproduced in Appendix 1.

## **WORKSHOP PROGRAMME**

Presentations by FAO on the first day of the workshop provided an overview of the components of the IPOA–Sharks and reviewed the status of global statistics on shark catches and trade reported to FAO. Common problems in the reported shark statistics were identified, including the lack of specificity in data and the uncertainties about the actual volume caught and traded. Despite the growing awareness on the need for better shark data raised by the IPOA–Sharks and the improvements in the species breakdown by some countries, it was concluded that significant improvements in data collection and reporting were still needed to make the management of shark fisheries effective. See Appendix 6 for detailed information on shark statistics in the FAO capture database.

Country reports presented by participants provided background information on the shark fisheries in their respective countries and highlighted the main limitations of the fishery and trade monitoring systems. Country reports are included in Appendix 7 of this report. In addition a presentation by the representative of

the Subregional Fisheries Commission (SRFC) highlighted the main outcomes of a project to strengthen the Sub-Regional Plan of Action for Sharks (Appendix 8). Discussions following the presentations centred on three themes:

- Impediments to the implementation of National Plan of Action for Sharks.
- Limitations and strategies for improving the level of reporting and monitoring of shark catches.
- Limitations and strategies for improving the reporting and monitoring of international trade in shark products.

Discussions held on these themes led to a series of conclusions about the limiting factors that are hampering the proper monitoring of shark fisheries and trade and to recommendations to improve the situation, which are reported in the following section.

## CONCLUSIONS AND RECOMMENDATIONS

After reviewing the global and country specific situation, the Workshop agreed on the following issues and approaches to improve the monitoring on catches and trade of sharks:

### *National Plan of Action for Sharks (NPOA–Sharks)*

The workshop reconfirmed that the slow progress in the development and implementation of NPOA for sharks was a major impediment to the improvement of management and monitoring of shark fisheries in some of the main shark fishing nations. Several common obstacles were identified in developing and implementing of NPOA–Sharks among different settings:

– Shark management requires good coordination and collaboration between agencies responsible for fisheries management and species conservation. However, the communication and collaboration between different national agencies are often inadequate. Some NPOA–Sharks have been developed by agencies responsible for species conservation with no or very limited consultation and communication with agencies responsible for fisheries management. In such cases, the resulting plans may not reflect the actual fishery situation and be hard to implement in the context of fishery management.

– The consultations with and participation of key stakeholders in the development process of the NPOAs were also limited. Adequate understandings on the objectives and planned actions among all stakeholders are essential for the NPOAs to be effective. Although managers, fishers, processors, dealers and traders are considered as primary stakeholders, sharks also have a considerable value for many other sectors, including tourism, recreational fisheries and general public. It was noted the need to sensitize managers and all stakeholders on the importance of establishing management and conservation efforts for sharks. These efforts should be developed in a participatory manner.

– In general, sharks represent only a low proportion of the total catch, are often caught as bycatch and have low commercial value, except for their fins. These characteristics make it difficult to get appropriate management attention as well as adequate resources and funds for their monitoring. Nevertheless, their life history characteristics coupled with the importance of international trade as a driver for the exploitation of some species, are compelling reasons for countries to develop NPOAs for sharks. In addition, it was highlighted that through the adoption of the Code of Conduct for Responsible Fisheries and the IPOA–Sharks, countries have already committed to develop sustainable management plans for its fisheries resources, including sharks.

– The requirements outlined in the IPOA–Sharks and in the FAO guidelines for its implementation<sup>8</sup> were considered complex and demanding, and for this reason many countries were unable to fully meet all requirements in the IPOA at the same time. While recognizing that the ultimate goal for countries involved in the capture of sharks would be to cover all the elements of the IPOA–Sharks, the implementation of the programme could be facilitated if a more pragmatic, step by step, approach towards the ultimate goal was adopted.

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<sup>8</sup> FAO Marine Resources Service. Fisheries management. 1. Conservation and management of sharks. *FAO Technical Guidelines for Responsible Fisheries*. No. 4, Suppl. 1. Rome, FAO. 2000. 37p.

In the context of developing and implementing the NPOAs, the Workshop recommended that countries:

- improve communication among different agencies, especially between those responsible for fishery management and for species conservation;
- ensure key stakeholders are well sensitized on the importance of shark management through improved communication;
- utilize a participatory approach with the involvement of all stakeholders, as broad as practical; and
- make plans as realistic and achievable as possible, including taking a step by step approach towards their full implementation.

The workshop identified that the first priority step towards an NPOA, especially for those countries which struggle with low monitoring and management capacity, is to improve information about catches and life history parameters on a limited number of their primary shark species. Those primary species should be identified based on: their quantity taken as capture (i.e. contribution to food security), their socio-economic importance to fishing communities, and other specific needs such as conservation concerns, including those species listed in the Appendices of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). A preliminary list of such species was developed during the workshop and is included in Appendix 4. It was suggested that a working group be formed during the twenty-eighth session of COFI in 2009 to refine the preliminary list included in this report. All countries should make every effort to monitor and collect catch and trade information for their agreed list of primary species, as appropriate.

The workshop considered that the above-mentioned step is a minimum initial requirement. Countries with better monitoring and management capacity should take further steps towards developing and implementing an NPOA in the full context of IPOA–Sharks, including the identification of main weaknesses in monitoring of shark fisheries and trade and the adoption of actions to overcome these limitations to realize the full monitoring of catch, bycatch, discards, and trade, both in terms of quantity and species composition.

The workshop recommended FAO to encourage countries fishing for sharks to take the above steps towards the development of NPOAs and to report on progress made at the twenty-ninth session of COFI in 2011. The workshop also recommended FAO to contact those countries who have initiated shark fisheries or trade after the adoption of the IPOA–sharks in 1999, to ensure that all relevant countries are developing and implementing NPOAs. It was noted that some countries have already developed management plans without developing NPOAs. In these cases countries could adapt their management plans into NPOAs.

The workshop noted that regional coordination could play a critical role in the monitoring and management of shark fisheries and trade, especially in those areas where fishers can easily migrate and land their catches in neighbouring countries. Countries already participating in regional fishery bodies (RFBs) are encouraged to provide information on shark catches and to develop regional coordination and collaboration for the monitoring and management of sharks through the relevant RFBs. In the cases of no existing RFBs, such coordination should be sought in consultation with FAO.

The workshop recognized the need for additional resources, especially trained personnel and funds. It indicated that the capacity building, especially in shark identification, should be recognized as a priority area for international aid to shark fishing nations with low monitoring and management capacity. The need to create incentives to foster the development of NPOAs for sharks was discussed. Such incentive could include the need to ensure sustainability of resources and the need to avoid the loss of consumer confidence.

#### ***Lack of specificity in data***

Most of the data on catch and trade of elasmobranchs reported to FAO were in highly taxonomically aggregated categories (e.g. “sharks and rays”). The Workshop agreed that aggregation as well as misidentification of species causes critical obstacles for monitoring of shark fisheries and trade. In principle, efforts should be made to obtain data at the highest taxonomic resolution possible. It is however recognized that there are too many species of sharks being caught and that it will be impossible in many instance for

inspectors, observers, port samplers and fishers to be able to identify and monitor the totality of shark species in addition to the more commercially important species. As a starting point to move forward, the Workshop recommended that countries should identify a list of primary species requiring special attention for monitoring and management purposes (see Appendix 4 as an example).

It was noted that in many cases the data available in national databases have a higher taxonomic resolution than the data reported to and available in the FAO database. It was clarified that the FAO request for data indicated clearly for countries to provide data with the most detailed species breakdown. FAO also stressed that it accepts any format in reporting to avoid restricting the level of aggregation of data reporting. However, the workshop recommended FAO to further communicate with countries to ensure the most detailed best quality data to be stored in the FAO global database.

Many participants reported the lack of appropriate taxonomic lists, field guides and other identification tools for sharks. The tools include not only those for identification of whole animals but also for the identification of species from parts and products, from the capture to the final commercialization. In order to assist in identifying existing gaps and priority areas that need particular attention, participants listed field guides and other available tools in their respective countries, organizations and regions (Appendix 5). As a matter of priority, the workshop recommended FAO to finalize and disseminate Volumes 1 and 2 of the species synopsis for sharks as well as to develop additional synopsis for batoids and chimaeras.<sup>9</sup>

The monitoring of fisheries should include the collection of biological information, such as length, sex and reproductive condition, as well as the collection of samples required for biological studies, in addition to the total quantity and species composition of the catch. Such information is often used as a basis to establish appropriate management measures, e.g. introduction of size limits of catch, setting closed area and season, and gear regulations. It was noted that fishery independent surveys as well as observer programmes would be additional important sources of such biological information. Considering the overall lack of biological information on shark species, the workshop strongly encouraged countries to include sharks as priority research areas for academic and fishery research institutes.

The lack of compatibility of the taxonomic resolution across the market chain, from catches to exports, was considered a limiting factor to allow the verification of catch and trade information. Similarly, the lack of capacity of fishery and customs officers to identify species was recognized as an important limitation. In this regard, countries should encourage the participation of the majority of the stakeholders in capacity building workshops for species identification. It was noted these training workshops should be done on a regular basis.

### ***Volume of catches***

The workshop felt that the volume of reported shark catches would very often underestimate the actual amount of removals. First, the capture monitoring generally focuses on landings and does not incorporate the portion discarded at sea. Also, even at landing sites, bycatch species with low commercial value tends to get less attention and be underreported.

Despite the adoption of no-finning regulations, the practice of discarding carcasses is considered to still exist especially when shark meat has no commercial value or use. With rare exceptions, the discarded component of catches remains unreported or underestimated. Strategies that have been used to obtain the information about discards include:

- monitoring by onboard observers adequately trained to identify shark species;

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<sup>9</sup> Compagno, L.J.V. (In preparation a). Sharks of the world. An annotated and illustrated catalogue of the shark species known to date. Volume 1. Hexanchiformes, Squaliformes, Squatiniformes and Pristiophoriformes. *FAO Species Catalogue for Fisheries Purposes*. No.1, Vol.1. Rome. FAO.

Compagno, L.J.V. (In preparation b). Sharks of the world. An annotated and illustrated catalogue of the shark species known to date. Volume 3. Carcharhiniformes. *FAO Species Catalogue for Fisheries Purposes* No.1. Vol.3. Rome. FAO.

Species Identification and Data Programme (SIDP), Fisheries and Aquaculture Department, FAO. (In preparation). Catalogue of batoids of the world. Rome. FAO.

- regulations to prevent discards (e.g. mandatory landing of both carcass and fins);
- mandatory reporting of discards, including introduction of special logbooks on discarded sharks (that require independent evaluation of reports); and
- estimates of species compositions from fishery independent surveys.

All of those procedures should be applied, where appropriate, to enhance knowledge on the discarded portion of shark catches. In addition, countries are also encouraged to use or develop gears and regulation that minimize the bycatch of sharks, including time/area closures. It was recognized that further work is needed to better define conversion factors from body parts to the live equivalent body weight. Countries are encouraged to examine existing materials in this regard.

#### ***Trade limitation***

The main limitation in monitoring trade was the codes used at customs that aggregate all shark species and lack clear separation of processed commodities. This indicated that even when catches were monitored at species level, such information would be lost once entering trade.

The existing global Harmonized System (HS) has no specific code for rays, no separate code for cured shark products and no way to separate shark fins from other shark products. Participants were informed that FAO has currently tabled a proposal to the World Customs Organization (WCO) to establish separate codes for shark fins by four different product types: fresh, frozen, dried and cured. This proposal would be discussed at the forthcoming WCO meeting on 18 and 19 November 2008. Participants were urged to communicate with their national responsible agencies to support this proposal.

Regardless of the conclusion taken by the WCO, the Workshop recommended CITES and FAO to encourage countries to amend their national codes to enable clear separation of shark fins and shark meat as a minimum initial step to improve monitoring capability and traceability of shark products in trade. When appropriate and feasible, it also encouraged countries to incorporate codes to separate different type of shark fin products, e.g. dried, wet, and cured, with corresponding conversion factor to live-equivalent weight. Countries were requested to report to FAO the amended national codes, together with the corresponding data, whenever such amendments would be incorporated.

Caution was raised in interpreting shark fin trade quantities in terms of production estimates, recognizing that fins were transferred among multiple countries through processing over multi-years. It was suggested that additional data on product types would improve traceability in the whole process.

#### ***Illegal, unreported and unregulated (IUU) fishing***

The workshop did not agree on any specific measures under this issue. Feasibility and effectiveness of licensing for shark fin traders and export certificates were briefly discussed. Although both measures may have potential in improving monitoring of shark fin trade, the Workshop recognized that the feasibility of implementation would vary widely according to national legislation systems. Also, such measures may cause difficulties in application if considered to induce trade barriers, unless they are based on international agreements (e.g. CITES). However, countries could implement such measures voluntarily.





## APPENDIX 1

## Agenda

<b><i>Monday 3 November. Introduction and Country Reports.</i></b>	
<b>08.30 – 09.00</b>	<b>Registration</b>
<b>09.00 – 10.00</b>	<ol style="list-style-type: none"> <li>1. Opening of the Workshop</li> <li>2. Adoption of agenda</li> <li>3. Workshop background and objectives</li> </ol>
<b>10.00 – 10.30</b>	<b>Coffee break</b>
<b>10.30 – 11.00</b>	The IPOA-Sharks and the role of fisheries and trade monitoring in the management and conservation of shark resources. M. Vasconcellos.
<b>11.00 – 11.30</b>	Elasmobranch statistics in the FAO capture database. S. Tsuji.
<b>11.30 – 12.00</b>	Elasmobranch trade statistics in the FAO database. S. Vannuccini.
<b>12.00 – 13.30</b>	<b>Lunch</b>
<b>13.30 – 16.00</b>	Country reports: Status of shark fisheries and trade.
<b>16.00 – 16.30</b>	<b>Coffee Break</b>
<b>16.30 – 18.00</b>	Country reports: Status of shark fisheries and trade.
<b>18.00</b>	<b>End of day one</b>
<b><i>Tuesday 4 November. Status and progress of the NPOA-Sharks</i></b>	
<b>09.00 – 10.00</b>	Summary of country reports and plenary discussions on the main limitations for the implementation of NPOA-Sharks
<b>10.00 – 10.30</b>	Plenary discussions: continued
<b>10.30 – 11.00</b>	<b>Coffee break</b>
<b>11.00 – 12.00</b>	Plenary discussions: continued
<b>12.00 – 13.30</b>	<b>Lunch</b>
<b>13.30 – 16.00</b>	Plenary discussions: continued
<b>16.00 – 16.30</b>	<b>Coffee Break</b>
<b>16.30 – 18.00</b>	Plenary discussions: continued
<b>18.00</b>	<b>End of day two</b>
<b><i>Wednesday 5 November. Shark fisheries monitoring</i></b>	
<b>09.00 – 10.00</b>	Summary of country reports and plenary discussions on the main limitations for the monitoring of shark fisheries
<b>10.00 – 10.30</b>	Plenary discussions: continued
<b>10.30 – 11.00</b>	<b>Coffee break</b>
<b>11.00 – 12.00</b>	Plenary discussions: continued
<b>12.00 – 13.30</b>	<b>Lunch</b>
<b>13.30 – 16.00</b>	Plenary discussions: continued
<b>16.00 – 16.30</b>	<b>Coffee Break</b>
<b>16.30 – 18.00</b>	Plenary discussions: continued
<b>18.00</b>	<b>End of day three</b>

<b><i>Thursday 6 November. Monitoring of trade in shark products</i></b>	
<b>09.00 – 10.00</b>	Summary of country reports and plenary discussions on the main limitations for the monitoring of trade in shark products
<b>10.00 – 10.30</b>	Plenary discussions: continued
<b>10.30 – 11.00</b>	<b>Coffee break</b>
<b>11.00 – 12.00</b>	Plenary discussions: continued
<b>12.00 – 13.30</b>	<b>Lunch</b>
<b>13.30 – 16.00</b>	Plenary discussions: continued
<b>16.00 – 16.30</b>	<b>Coffee Break</b>
<b>16.30 – 17.30</b>	Adoption of workshop conclusions and recommendations
<b>17.30 – 18.00</b>	<b>Workshop closure</b>

**APPENDIX 2****List of participants****ARGENTINA**

Ramiro Pedro SANCHEZ  
 Director de Planificación Pesquera  
 Subsecretaría de Pesca y Acuicultura  
 Paseo Colón 892  
 Ciudad Autónoma de Buenos Aires  
 Tel.: +54 11 4349 2590  
 Fax: +54 11 4349 2594  
 E-mail: rasanc@mecon.gov.ar  
 sanchez.ramiro@speedy.com.ar

Elisa CALVO  
 Fishery Economy Section  
 Subsecretaría de Pesca y Acuicultura  
 Paseo Colón 892  
 Ciudad Autónoma de Buenos Aires  
 Tel.: +54 11 43492476  
 Fax: +54 11 43492594  
 E-mail: elical@mecon.gov.ar

**CHINA HONG KONG SPECIAL ADMINISTRATIVE REGION**

Alfred K.C. WONG  
 Agriculture, Fisheries and Conservation  
 Department  
 6/F., Cheung Sha Wan Government  
 Offices,  
 303 Cheung Sha Wan Road,  
 Kowloon, Hong Kong.  
 Tel.: +852 2150 6982  
 Fax: +852 23774413  
 E-mail: alfred\_kc\_wong@afcd.gov.hk

**GHANA**

Paul BANNERMAN  
 Fish Stocks and Statistics Section  
 Marine Fisheries Research Division (MFRD)  
 Ministry of Fisheries  
 PO Box BT 62  
 Tema  
 Tel.: +233 22202346  
 Fax: +233 22206627  
 E-mail: paulbann@hotmail.com

**INDONESIA**

FAHMI  
 Marine Resources Division  
 Research Centre for Oceanography  
 Indonesian Institute of Sciences (LIPI)  
 Jl. Pasir Putih No. 1  
 Ancol Timur, Jakarta Utara  
 Tel.: +62 21 64713850 – ext. 210  
 Fax: +62 21 64711948  
 E-mail: fahmi@lipi.go.id

**IRAN (ISLAMIC REPUBLIC OF)**

Tooraj VALINASSAB  
 Head of Marine Resource Management  
 Division  
 Iranian Fisheries Research Organization  
 297, West Fatemi Avenue  
 PO Box 14155–6116  
 Tehran  
 Tel.: +98 21 66945145  
 Fax: +98 21 66420732  
 E-mail: t\_valinassab@yahoo.com

**ITALY**

Fabrizio SERENA  
 ARPAT (Environmental Protection Agency –  
 (Tuscany Region)  
 Head of Marine Service  
 Via Marradi 114  
 57100 Livorno  
 Tel.: +39–0586–263496  
 Fax: +39–0586–263477  
 Mobile: + 39 3204391149  
 E-mail: f.serena@arpat.toscana.it

**JAPAN**

Hideki MORONUKI  
 Assistant Director  
 Ecosystem Conservation Office  
 Fisheries Agency  
 1-2-1 Kasumigaseki, Chiyoda-ku  
 Tokyo 100-8950  
 Tel.: +81 3 35028487  
 Fax: +81 3 35021682  
 E-mail: hideki\_moronuki@nm.maff.go.jp

Hideki NAKANO  
 Chief, planning and Coordination Section  
 National Research Institute of Far Seas  
 Fisheries  
 Project Management Division  
 5-7-1 Orido Shimizu, Shizuoka 424-8633  
 Tel.: +81 54 3366013  
 Fax: +81 54 3359642  
 E-mail: hnakano@affrc.go.jp

**PAKISTAN**

Muhammad MOAZZAM KHAN  
 Director Planning and Statistics  
 Marine Fisheries Department  
 Government of Pakistan  
 Fish Harbour, West Wharf  
 Karachi  
 Tel.: +92 21 2316535  
 Fax: +92 21 2316539  
 Mobile: 0300 2114066  
 E-mail: mmoazzamkhan@gmail.com

**PANAMA**

Yehudi Nafisa RODRÍGUEZ ARRIATTI  
 Departamento de Ordenamiento de la  
 Dirección  
 General de Ordenación y Manejo  
 Integral  
 Vía Simón Bolívar, Transistmica; Edificio paso  
 elevado, segunda Planta  
 Tel.: +507 5116000 – ext: 115  
 Fax: +507 5116065  
 E-mail: yehudi@uabcs.mx

**SENEGAL**

Lamine MBAYE  
 Ministère de l'économie maritime  
 Direction des pêches maritimes  
 Division Gestion et aménagement des  
 pêches  
 1, rue Joris, B.P. 289  
 Dakar  
 Tel.: +33 821 04 43  
 Fax: +33 821 47 58  
 Mobile: +77 558 39 39  
 E-mail: lemzo67@hotmail.com

**SPAIN**

Gabriel MOREY  
 Dirección General de Pesca  
 Gouvernement des îles Baléares  
 c/o Foners, 10  
 07006 Palma de Mallorca  
 E-mail: gmorey@dgpesca.caib.es

**SRI LANKA**

Champa AMARASIRI  
 Director  
 National Aquatic Resources Research and  
 Development Agency (NARA)  
 Crow Island - Mattakkuliya  
 Colombo 15  
 Tel.: +94 602075087  
 Fax: +94 112521932  
 E-mail: champa@nara.ac.lk

**UNITED STATES OF AMERICA**

John CARLSON  
 Research Fishery Biologist  
 NOAA/National Marine Fisheries Service  
 3500 Delwood Beach Road  
 Panama City, FL 32408  
 Tel.: +1 850 2346541 ext. 221  
 Fax: +1 850 2353559  
 E-mail: john.carlson@noaa.gov

**INTERNATIONAL ORGANIZATIONS****CONVENTION IN INTERNATIONAL  
TRADE IN ENDANGERED SPECIES  
(CITES)**

Robert BOLJESIC  
CITES Secretariat - Maison internationale  
de l'environnement  
11-13, Chemin des Anémones  
CH-1219 Châtelaine  
Geneva  
Switzerland  
Tel.: +41 22 9178131  
Fax: +41 22 7973417  
E-mail: Robert.Boljesic@cites.org

**PERMANENT SECRETARIAT OF THE  
SUBREGIONAL FISHERIES COMMISSION  
(SRFC)**

Mika DIOP  
Conseiller  
Coordinateur du projet PSRA-Requins  
Secrétariat permanent de la Commission  
sous-régionale des pêches (CSRP)  
SICAP, Amitié 3, Villa 4430  
BP 25485  
Dakar  
Senegal  
Tel.: +221 33 8640477  
Mobile: +221 77 6448218  
E-mail: csrp@sentoo.sn  
mika\_dfr@yahoo.fr

**TRAFFIC INTERNATIONAL**

Maylynn ENGLER  
Research Officer  
219a Huntingdon Road  
Cambridge, UK  
CB30BL  
United Kingdom  
Tel.: +44 1223 277427  
Fax: +44 1223 277237  
E-mail: Maylynn.Engler@traffic.org

**WILDLIFE INTERNATIONAL (WWF)**

Colman O'CRIODAIN  
Wildlife Trade policy Analyst  
Species Programme  
1196 Gland  
Switzerland  
Tel.: +41 22 3649111 – direct: 3649251  
Fax: +41 22 3646624  
E-mail: COCriodain@wwfint.org

**FAO  
Viale delle Terme di Caracalla  
00153 Rome, Italy**

Kevern COCHRANE  
Chief  
Fisheries Management and Conservation  
Service  
Fisheries and Aquaculture Management  
Division  
Fisheries and Aquaculture Department  
Tel.: +39-06-570-56109  
Fax: +39-06-570-53020  
E-mail: Kevern.cochrane@fao.org

Sachiko TSUJI  
Senior Fisheries Statistician  
Fisheries and Aquaculture Information and  
Statistics Service  
Fisheries and Aquaculture Economics and  
Policy Division  
Fisheries and Aquaculture Department  
Tel.: +39 06 570 55318  
Fax: +39 06 570 52476  
E-mail: sachiko.tsuji@fao.org

Stefania VANNUCCINI  
Fishery Statistician (Commodities)  
Fisheries and Aquaculture Information and  
Statistics Service  
Fisheries and Aquaculture Economics and  
Policy Division  
Fisheries and Aquaculture Department  
Tel.: +39 06 570 54949  
Fax: +39 06 570 52476  
E-mail: stefania.vannuccini@fao.org

Luca GARIBALDI  
Fishery Statistician (Capture Fisheries)  
Fisheries and Aquaculture Information and  
Statistics Service  
Fisheries and Aquaculture Economics and  
Policy Division  
Fisheries and Aquaculture Department  
Tel.: +39 06 570 53867  
Fax: +39 06 570 52476  
E-mail: luca.garibaldi@fao.org

Anne VAN LIERDE  
Secretariat Assistant  
Fisheries Management and Conservation  
Service  
Fisheries and Aquaculture Management  
Division  
Fisheries and Aquaculture Department  
Tel.: +39-06-570-56645  
Fax: +39-06-570-53020  
E-mail: anne.vanlierde@fao.org

Marina MANSUETI  
Operations Clerk  
Fisheries Management and Conservation  
Service  
Fisheries and Aquaculture Management  
Division  
Fisheries and Aquaculture Department  
Tel.: +39-06-570-562159  
Fax: +39-06-570-53020  
E-mail: marina.mansueti@fao.org

#### **INTERNATIONAL CONSULTANT**

Marcelo VASCONCELLOS  
Rua Osvaldo Muller Barlem 529  
Cassino, Rio Grande, RS Brasil 96207-630  
Brazil  
Tel.: +55 53 32362735  
Mobile: +55 5381144512  
E-mail: marcelo.vasconcellos@fao.org

### APPENDIX 3

#### **Welcome speech by Mr Ichiro Nomura, Assistant Director-General FAO Fisheries and Aquaculture Department**

It is my pleasure to welcome you to this Technical Workshop on Status, Limitations and Opportunities for Improving the Monitoring of Shark Fisheries and Trade.

FAO has been actively involved in efforts to improve the management and conservation of shark resources and this workshop is expected to help us strengthen some key aspects of the FAO International Plan of Action for the Conservation and Management of Sharks (IPOA–Sharks).

The IPOA–Sharks is a voluntary instrument, elaborated within the framework of the Code of Conduct for Responsible Fisheries. It was endorsed by FAO member countries at the twenty third session of COFI held in Rome in 1999. The main objective of the IPOA–Sharks is to ensure the conservation and long-term sustainable use of sharks, including species that are target and non-target of fisheries.

Progress towards the implementation of FAO's IPOAs is regularly reported to COFI. At the twenty-seventh session of COFI, held in 2007, many Members referred to their efforts to develop National Plans of Action (NPOAs) to implement the IPOA–Sharks, including reporting on policies and practices in place to ban the catching of some shark species and other measures prohibiting finning and carcass dumping as a means of promoting sustainability. Despite these initiatives, and the progress made in recent years, the Committee concurred that further intensive work was required to improve the implementation of the IPOA–Sharks.

With this in mind, this technical workshop was organized with the objective to define a strategy to improve one of the most fundamental sources of information for managing shark fisheries: the information about shark catches. As you all know, in many localities the available information is less than adequate to allow the assessment of stocks and to monitor the effect of management interventions. Problems in the identification of species, illegal, unreported and unregulated fishing, all figure as important constraints to the proper monitoring of shark catches. In addition, the monitoring of trade in shark products, also to be discussed in the workshop, is viewed as a key auxiliary source of information about the magnitude of catches of some species targeted for international trade.

It is clear that the improvement of the monitoring of shark fisheries and the trade in shark products can make a considerable contribution to the successful implementation of national, regional and international efforts to shark conservation and sustainable use. International assistance will have an important role to play in improving the current situation. However in order to be effective, assistance will need to be tailored to the specific needs of the shark fishing nations. In this context this workshop will attempt to obtain a better understanding of the current situation and the limitations in the monitoring of sharks fisheries and trade in some of the main shark fishing nations, and based on that, to identify opportunities for future improvement.

You have been selected in your individual capacities, on the basis of your expertise in shark fisheries in your respective countries, and FAO is looking to you to help us in this important meeting. I must also thank the CITES Secretariat, WWF and Traffic for joining us at this meeting.

Finally, I would like to thank you all for giving up your time to help us in this important task and the government of Japan for the financial assistance they have provided that has made this meeting possible.

I wish you a fruitful and enjoyable meeting.

## APPENDIX 4

**Provisional list of primary species of elasmobranchs for the monitoring  
of fisheries and trade**

<b>TAXON</b>	<b>ENGLISH NAME</b>	<b>COUNTRIES LISTING</b>
<i>Alopias</i> spp.	Thresher sharks	Panama, Sri Lanka, Indonesia
Batoidea	Skates	Spain <sup>1</sup>
<i>Callorhynchus callorhynchus</i>	Elephant fish	Argentina
<i>Carcharhinus</i> spp.		Spain
<i>Carcharhinus dussumieri</i>	Whitecheek shark	Iran, Islamic Republic of
<i>Carcharhinus falciformis</i>	Silky shark	China, Hong Kong SAR <sup>2</sup> , Sri Lanka, Indonesia
<i>Carcharhinus limbatus</i>	Blacktip shark	United States of America, West Africa
<i>Carcharhinus longimanus</i>	Oceanic whitetip shark	Panama
<i>Carcharhinus plumbeus</i>	Sandbar shark	China, Hong Kong SAR, United States of America
<i>Carcharhinus sorrah</i>	Spottail shark	Iran, Islamic Republic of
<i>Centrophorus</i> spp.	Gulper Sharks	Sri Lanka
<i>Dipturus chilensis</i>	Yellownose skate	Argentina
<i>Galeocerdo cuvieri</i>	Tiger shark	Ghana
<i>Galeorhinus galeus</i>	Tope, school shark	Argentina
<i>Gymnura altavela</i>	Spiny butterfly ray	West Africa
<i>Himantura gerrardi</i>	Whitespotted whiplay	Indonesia
<i>Isurus oxyrinchus</i>	Shortfin Mako	China, Hong Kong SAR, Spain, United States of America, Japan
<i>Lamna ditropis</i>	Salmon shark	Japan
<i>Lamna nasus</i>	Porbeagle	Spain
<i>Leptocharias smithii</i>	Barbeled houndshark	West Africa
<i>Mustelus mustelus</i>	Common smooth-hound shark	Italy, West Africa
<i>Mustelus schmitti</i>	Narrownose smooth-hound shark	Argentina
<i>Prionace glauca</i>	Blue Shark	China, Hong Kong SAR, Spain, Panama, Ghana, United States of America, Japan
<i>Raja</i> spp.	Skates	Japan, Italy
<i>Pristis pectinata</i>	Smalltooth sawfish	United States of America
<i>Rhinobatos cemiculus</i>	Blackchin guitarfish	West Africa
<i>Rhinobatos irvinei</i>	Spineback guitarfish	West Africa
<i>Rhynchobatus lubberti</i>	African wedgefish	West Africa
<i>Rhinobatos rhinobatos</i>	Common guitarfish	West Africa
<i>Rhizoprionodon acutus</i>	Milk shark	Iran (Islamic Republic of), Ghana, West Africa
<i>Rhynchobatus australie</i>	Whitespotted guitarfish	Indonesia
<i>Scyliorhinus canicula</i>	Small-spotted cat shark	Italy
<i>Sphyrna</i> spp.	Hammerhead sharks	Argentina, China, Hong Kong SAR, Iran (Islamic Republic of), Panama, Sri Lanka, Ghana, Indonesia, West Africa, United States of America
<i>Squalus acanthias</i>	Spiny dogfish	Spain, Argentina, Japan
<i>Squalus blainvillei</i>	Longnose spurdog	Italy
<i>Squatina</i> spp.	Angel sharks	Argentina, Ghana, West Africa

<sup>1</sup> Select genera to be defined.

<sup>2</sup> Listing of China, Hong Kong SAR, species is related to fin trade.



## APPENDIX 5

### List of available field guides and other identification tools for elasmobranch species

#### FAO Species Catalogues

- Compagno, L.J.V.** 1984a. FAO species catalogue.Vol.4. Sharks of the world. An annotated and illustrated catalogue of sharks species known to date. Part 1. Hexanchiformes to Lamniformes (1–249 pp.) and Part 2: Carcharhiniformes (251–655). *FAO Fish. Synop.*, (125) Vol.4
- Compagno, L.J.V.** 2001. Sharks of the world. An annotated and illustrated catalogue of shark species known to date. Vol.2. Bullhead, mackerel, and carpet sharks (Heterodontiformes, Lamniformes and Orectolobiformes). *FAO Species Catalogue for Fishery Purposes*. No.1, Vol.2. Rome, FAO. 269 pp

#### FAO Field Guides

- Bonfil, R. and Abdallah, M.** 2004. Field identification guide to the sharks and rays of the Red Sea and Gulf of Aden. *FAO Species Identification Guide for Fishery Purposes*. Rome, FAO, 71 p., 12 colour plates.
- Serena, F.** 2005. Field identification guide to the sharks and rays of the Mediterranean and Black Sea. *FAO Species Identification Guide for Fishery Purposes*. Rome, FAO, 97 p., 11 colour plates + egg cases.

#### FAO Species Identification Cards

- FAO.** 2007. Sharks and rays of the Red Sea and the Gulf of Aden. FAO Species Identification Cards. Rome, FAO. 2007
- FAO.** 2008. Sharks and rays of the Mediterranean and Black Sea. FAO Species Identification Cards. Rome, FAO.

#### Publications only on CD-ROM

- FAO.** 2007. Sharks, rays and chimaeras. Excerpts from FAO Species Identification publications as of 2007. Rome, FAO. 2007

This CD-ROM, in addition to the above cited publications, also contains chapters excerpted from most of the Regional Guides already published by SIDP.

#### For species listed under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

- <http://www.cites.org/eng/resources/species.html>  
<http://www.cites.org/eng/resources/ID/index.php>

#### Argentina (FAO Fishing Area 87)

Guía de campo para la identificación de peces cartilaginosos en el Río de la Plata y su frente marítimo.  
<http://www.sagpya.mecon.gov.ar/>

#### Japan (FAO Fishing Area 61, 71, 77, 81, 87)

##### Manuals and guidebooks

Identification Manual for Bycatch Species caught in Longline Fisheries. 1994. National Research Institute of Far Seas Fisheries.

Identification Manual for Bycatch Species caught in the Southern Bluefin Tuna Fishing Ground. 1995. National Research Institute of Far Seas Fisheries.

Identification Guidebook for Pelagic Species caught in Longline Fisheries. 2002. National Research Institute of Far Seas Fisheries.

##### Posters

Sharks caught in Longline Fisheries. 1992. National Research Institute of Far Seas Fisheries.

Shark Species occurring in Pelagic Waters. 2004. Fisheries Agency of Japan, Global Guardian Trust.

Desk pads

Identification Manual for Shark Species caught in Tuna Longline Fisheries. 1995. National Research Institute of Far Seas Fisheries.

Field cards

Shark Species occurring in Pelagic Waters and Coastal Waters. 2004. Fisheries Agency of Japan, National Research Institute of Far Seas Fisheries.

**Indonesia (FAO Fishing Area 57 and 71)**

**White, W.T.; Last, P.R.; Stevens, J.D.; Yearsley, G.K.; Fahmi and Dharmadi.** 2006. Economically important sharks and rays of Indonesia. Australian Centre for International Agricultural Research. 338 p.

**Last, P.R.; White, W.T.; and Pogonoski, J.J.** 2007. Descriptions of new dogfishes of the genus *Squalus* (Squaloidea: Squalidae). CSIRO Marine and Atmospheric Research Paper; 14. 136 p.

**Mediterranean Sea (FAO Fishing Area 37)**

**Serena, F.** 2005. Field identification guide to the sharks and rays of the Mediterranean and Black Sea. FAO Species Identification Guide for Fishery Purposes. Rome, FAO. 97p. 11 colour plates + egg cases.

**Serena, F.** Field Identification Guide to the Rays of the Mediterranean Sea. Guidelines for Data Collection and Analysis. Società Italiana di Biologia Marina. (Comitato Necton e Pesca)

**Identification guide for fins**

**Deynat, P.** 2008. in press. Guide d'identification des nageoires de requins: Espèces vulnérables, en danger et en danger critique d'extinction. WWF/TRAFFIC report. Expected to be available in early 2009 at [www.traffic.org](http://www.traffic.org).

**Persian Gulf and Oman Sea (FAO Fishing Area 51)**

**Carpenter, K.E., Krupp, F., Jones, D.A. and Zajonz, U.,** 1997. Living marine resources of Kuwait, Eastern Saudi Arabia, Bahrain, Qatar and UAE. FAO Species Identification Field guide for Fishery Purposes. ISBN 92-5-103741-8. 293 p.

**Asadi, H. and Dehghani, R.** 1998. Fishes of the Persian Gulf and Oman Sea. Iranian Fisheries Research Organization.

**Fischer, W. and Bianchi, G.** 1984. FAO species identification sheets for fishery purposes. Western Indian Ocean (Fishing Area 51). FAO Rome, Vol. 1-5.

**United States (FAO Fishing Area 31, 21 and 67)**

**Schulze-Haugen, M., Corey, T. and Kohler, N.E.** 2004. Guide to Sharks, Tunas, and Billfishes of the U.S. Atlantic and Gulf of Mexico. NOAA and Rhode Island Sea Grant, Silver Springs, MD, 118 p.

**Ebert, D.A.** 2003. The sharks, rays and chimaeras of California. University of California Press, 284 pp. (UC Press).

**Stevenson, D.E., Orr, J.W., Hoff, G.R., McEachran, J.D.** 2007. Field Guide to Sharks, Skates, and Ratfish of Alaska. Alaska Sea Grant College Program.

**Castro, J.I.** 1983. The Sharks of North American Waters. Texas A & M University Press.

**West Africa (FAO Fishing Area 34)**

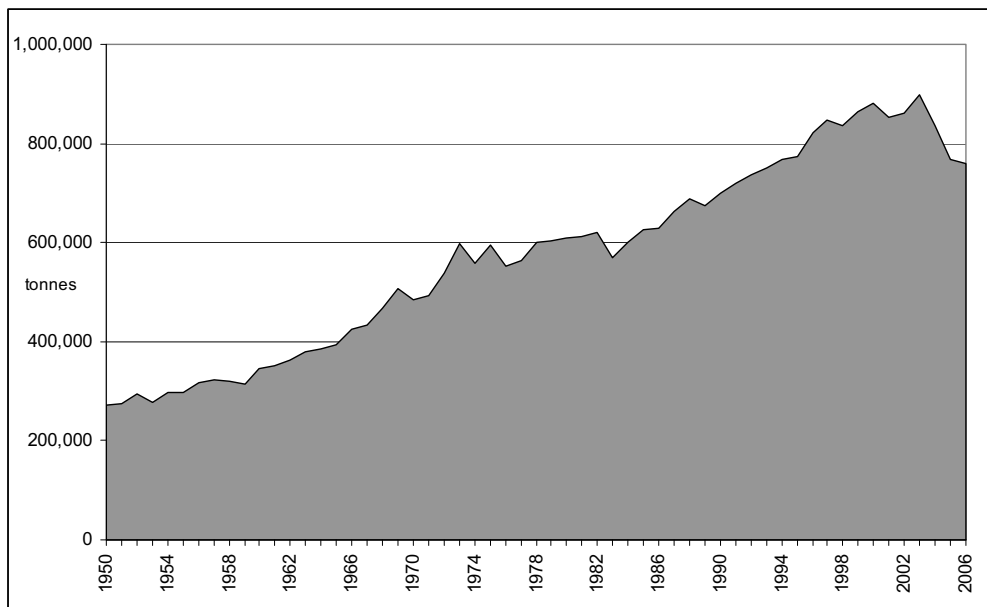
**Seret, B.** 2006. Identification guide of the main shark and ray species of the eastern tropical Atlantic, for the purpose of the fishery observers and biologist. IUCN. Programme régional de conservation de zone côtière et marine

## APPENDIX 6<sup>1</sup>

### Shark statistics in the FAO capture database

The FAO Fisheries and Aquaculture Information and Statistics Service (FIES) collates annual global fishery statistics on capture and aquaculture production, trade, apparent consumption, fishing vessels and fishers. Capture statistics are collected by country, FAO fishing area and species item through national correspondents. The quality of the FAO statistics depends upon the accuracy and reliability of the data collected nationally and provided to FAO.

According to the data included in the FAO capture database, total catches of the “Sharks, rays, chimaeras”<sup>2</sup> species group reached a maximum in 2003 of almost 900 000 tonnes and have been declining in recent years to 758 000 tonnes in 2006, a drop of 15 percent since the peak (see in Figure 1 the complete 1950–2006 trend).



**Figure 1:** Total catches for “Sharks, rays, chimaeras” in the FAO capture database

When analysing the trend of shark catches in the last decade, it should be taken into account that this species group has been at the centre of the attention of international institutions (e.g. FAO’s promoted International Plan of Action on Sharks), regional fishery organizations, as well as the public, and this has helped to improve the reporting of catches for this group although this may alter the trend. To obtain the best possible collation of available shark data, FAO also complements data reported by countries with those collected by the regional tuna bodies. However, collection and reporting of shark data still need to improve significantly as detailed information is needed to make effective management measures.

Initiatives taken by FAO and Regional Bodies, following the invitation of the ninth CITES Conference of the Parties (COP 9, Fort Lauderdale, Florida, USA, 7–18 November, 1994) to improve monitoring of catch and trade of shark species, included addenda listing shark species to STATLANT questionnaires (managed by FAO on behalf of ICES<sup>3</sup>, NAFO<sup>4</sup>, GFCM<sup>5</sup> and CECAF<sup>6</sup>) and collection of shark statistics by tuna regional commissions (ICCAT<sup>7</sup> and IOTC<sup>8</sup>). Thanks also to the growing awareness on the needs of better shark data

<sup>1</sup> Prepared by the Fisheries and Aquaculture Information and Statistics Service (FIES).

<sup>2</sup> Unless differently specified, in the text of this document the term “shark” is taken to include all species of sharks, rays and chimaeras (class Chondrichthyes).

<sup>3</sup> International Council for the Exploration of the Sea.

<sup>4</sup> Northwest Atlantic Fisheries Organization.

<sup>5</sup> General Fisheries Commission for the Mediterranean. Since 2007, the STATLANT 37 questionnaire is managed by the GFCM Secretariat.

<sup>6</sup> Fishery Committee for the Eastern Central Atlantic.

<sup>7</sup> International Commission for the Conservation of Atlantic Tunas.

<sup>8</sup> Indian Ocean Tuna Commission.

raised by the IPOA-Sharks, a greater number of countries have been reporting shark capture statistics with a good breakdown by species, whereas in the past several countries reported only aggregated data. Table 1 shows the breakdown of shark statistics included in the FAO capture database for the last two years (2005 and 2006) for which catch statistics have been compiled, and subsequently backwards at five-year intervals.

**Table 1:** Breakdowns of FAO capture statistics for the “Sharks, rays, chimaeras” species group

	1980	1985	1990	1995	2000	2005	2006
Species items*	16	19	38	44	80	115	120
Countries	86	92	102	122	124	132	132
Fishing areas	16	17	17	17	18	18	18
Total number of data series with data	288	304	354	422	575	749	743
Percentage of unidentified catches reported above the family level	67.0%	65.8%	65.0%	67.5%	69.5%	56.6%	57.1%

\*Counted as number of species items included in the FAO Yearbook of Fishery Statistics on that year.

The number of shark species items included in the FAO capture database almost doubled between 1995 and 2000, and another 40 species items have been added since then. However, the number of unidentified catches reported above the family level is still very high, although in the last two years it decreased significantly due to data reported at a more detailed level by Indonesia, the global top country for reported shark catches. It should be taken into account that very often data are included for the database through revisions and/or additions (e.g. when the tuna regional bodies make their shark data available) and this may explain the decrease of 2006 total number of data series in comparison with the previous year. Growth pace of the number of “Sharks, rays, chimaeras” species items has been greater than the overall increase in the FAO capture database, as the share of this group on total species items increased 3.6 times during the period examined (see Table 2).

**Table 2.** Percentage of “Sharks, rays, chimaeras” on total species items in the FAO database

	1980	1985	1990	1995	2000	2005	2006
“Sharks, rays, chimaeras” species items	16	19	38	44	80	115	120
Total species items**	800	840	995	1 080	1 255	1 581	1 640
Percentage of “Sharks, rays, chimaeras” on total species items	2.0%	2.3%	3.8%	4.1%	6.4%	7.3%	7.3%

\*\*Counted as number of species items included in the FAO Yearbook of Fishery Statistics on that year. Until 1996, the FAO Capture Yearbook included also data for aquaculture species.

Besides improvements in the data reported by national authorities, breakdown increases have also been achieved separating from generic groups those catches reported at the genus/species level whenever the information was available and including data from additional sources. The former improvement has been facilitated by the creation of the ASFIS species list<sup>9</sup> that has made codes available for all proper shark species and for most of the rays and chimaeras. The additional sources providing shark statistics have been the ad hoc inquiry for the preparation of the Castro, Woodley and Brudek, FAO Fisheries Technical Paper<sup>10</sup>, and the ICCAT and IOTC shark statistics. Only some of the data collected with the ad hoc inquiry have been included in the FAO capture database as they often covered a single or a few years and no other data were reported in the standard submissions for the subsequent years. Data disseminated by ICCAT and IOTC on

<sup>9</sup>Garibaldi, L. and Busilacchi, S. (comps.), 2002. ASFIS list of species for fishery statistics purposes. *ASFIS Reference Series*, No. 15, Rome, FAO, 258 p. Downloadable at [www.fao.org/fi/statist/fisoft/asfis/asfis.asp](http://www.fao.org/fi/statist/fisoft/asfis/asfis.asp)

<sup>10</sup>Castro, J.I., Woodley, C.M. and Brudek, R.L. 1999. A preliminary evaluation of the status of shark species. *FAO Fisheries Technical Paper*. No. 380. Rome, FAO, 72p.

shark catches have been utilized when a given quantity, species or country was not yet included in the FAO database.

Catch statistics on sharks included in the FAO capture database are widely used for trend and production studies. However, data have to be managed carefully as analyses may easily result in being biased by a series of factors. For example, the above mentioned increase of breakdown by species may bias the overall total catches, as quantities earlier reported as “Marine fishes not elsewhere identified” could have later been reported under sharks species or unidentified sharks, and also modify the trend of single data series. The large use of assumptions in some papers (e.g. the proportions assumed by Clarke *et al.* (2006)<sup>11</sup> of proper sharks and of skates, rays, and chimaeras included under “Elasmobranchii” in the FAO database) may undermine the credibility of the final results. In addition, calculations based on raising trade products (e.g. shark fins) to live weight may vary up to 2.5 times depending on the conversion factor applied, a controversial issue for the very different factors considered by conservation groups, scientific studies (e.g. Cortes and Neer, 2006<sup>12</sup>), and the industry. Figures produced raising data from fin trade were compared at an ICCAT meeting with data obtained by a different methodology based on ratios of shark to tuna landings from fleets reporting both to ICCAT. The meeting noted that the methodology estimated the potential catches of the two major shark species in the Atlantic to be half of the amount estimated by the fin trade study (see Figure 2 at page 878 of the Meeting Report<sup>13</sup>).

Efforts to improve the shark catch statistics should definitely continue. However, there still remains little that can be done by FAO-FIES to improve classification, collection, collation, and dissemination of catch data. Fishing countries, which still report unreliable or insufficiently detailed catch statistics, should realize that without continuous data series by species for such basic information like annual catches, effective national fisheries management would remain a “chimaera”.

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<sup>11</sup>Clarke, S.C., McAllister, M.K., Milner-Gulland, E.J., Kirkwood, G.P., Michielsens, C.G.P, Agnew, D.J., Pikitch, E.K, Nakano, H. and Shivji, M.S. 2006. Global estimates of shark catches using trade records from commercial markets. *Ecology Letters*, 9: 1115–1126.

<sup>12</sup>Cortes, E. and Neer, J.A. 2006. Preliminary re-assessment of the validity of the 5% fin to carcass ratio for sharks. *Collect. Vol. Sci. Pap. ICCAT*, 59, (3): 1025–1036.

<sup>13</sup>Anonymous. 2005. Report of the Inter-Sessional Meeting of the ICCAT Sub-Committee on Bycatches: Shark Stock Assessment (Tokyo, Japan, 14–18 June 2004). *SCRS/2004/014. Col. Vol. Sci. Pap. ICCAT*, 58 (3): 799–890.

