

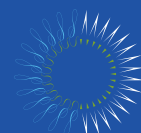


The Future of Sharks: A Review of Action and Inaction

January 2011

By Mary Lack and Glenn Sant

TRAFFIC
the wildlife trade monitoring network



THE
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TABLE OF CONTENTS

EXECUTIVE SUMMARY	2
INTRODUCTION	4
METHODS	5
THE TOP 20	6
CONSERVATION AND MANAGEMENT OF SHARKS	8
IPOA-Sharks Obligations and Commitments	8
RFMO Membership and Obligations	11
Convention on International Trade in Endangered Species of Wild Fauna and Flora	14
Convention on Migratory Species	15
ASSESSMENT	16
IPOA-Sharks Implementation	16
Catch and Trade Data	19
Management Issues	20
CONCLUSION & RECOMMENDATIONS TO COFI	22
REFERENCES	24
ACRONYMS	26
APPENDIX 1 Profiles	27
APPENDIX 2 Common and Scientific Names	41

EXECUTIVE SUMMARY

The 10-year anniversary of the adoption of the International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks) by the FAO Committee on Fisheries (COFI) is an opportune time to reflect on global progress in managing shark fisheries. The members of COFI agreed explicitly in the implementation section of the IPOA that all States should strive "...to have a Shark-plan by the COFI Session in 2001," that "States which implement the Shark-plan should regularly, at least every four years, assess its implementation for the purpose of identifying cost-effective strategies for increasing its effectiveness," and that "States should report on the progress of the assessment, development and implementation of their Shark-plans as part of their biennial reporting to FAO on the Code of Conduct for Responsible Fisheries." (FAO 1999) None of those elements of the IPOA-Sharks have been properly implemented.

Sharks¹ are particularly vulnerable to over-exploitation because of their biological characteristics of maturing late, having few young and being long-lived. Action on sharks by the Food and Agriculture Organization of the United Nations (FAO), international treaties such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), regional fisheries management organizations (RFMOs) and shark catching countries and entities has been prompted by increasing international concern about shark stocks as a result of a growing body of evidence that many shark species are threatened and continuing to decline because of unregulated fishing. This report assesses the nature and extent of management measures in place for sharks by the Top 20 "shark catchers"² identified from shark catch data provided to the FAO (see table).

The Top 20 account for nearly 80% of total reported shark catch, with Indonesia, India, Spain and Taiwan accounting for more than 35%. The future of many shark populations is essentially in the hands of the Top 20. One indicator of the commitment to shark management in the Top 20 is whether the recommendations of the IPOA-Sharks have been implemented. Currently, 13 of the Top 20 are known to have a National Plan of Action for the Conservation and Management of Sharks (NPOA-Sharks).

This analysis suggests that shark fisheries are likely to be generally well managed in only a few of the Top 20 and that, although NPOAs are in place in these, there is no evidence to indicate that the NPOAs are responsible for the effective management of shark fisheries. It is possible to speculate that this management is more likely to reflect better resourced and

Top 20 (% of Global Reported Shark Catch)	Shark Assessment Report	NPOA-Sharks
Indonesia (13%)	Not explicitly	Draft (not accessed)
India (9%)	No	In development
Spain (7.3%)	Yes (EU)	Yes
Taiwan (5.8%)	No	Yes
Argentina (4.3%)	Unknown	Yes
Mexico (4.1%)	Unknown	Yes
Pakistan (3.9%)	Unknown	Unknown
United States (3.7%)	Not explicitly	Yes
Japan (3.0%)	No	Yes
Malaysia (2.9%)	Yes (in NPOA)	Yes
Thailand (2.8%)	Unknown	Yes (could not be accessed)
France (2.6%)	Yes (EU)	Yes
Brazil (2.4%)	Unknown	Yes (could not be accessed)
Sri Lanka (2.4%)	No	No (has sought assistance)
New Zealand (2.2%)	Not explicitly	Yes
Portugal (1.9%)	Yes (EU)	Yes
Nigeria (1.7%)	Unknown	Unknown
Iran (1.7%)	Unknown	Unknown
U.K. (1.6%)	Yes (EU)	Yes
South Korea (1.4%)	Unknown	Unknown (may be in progress)

¹ The term "sharks" refers to all species of sharks, skates, rays and chimaeras (Class Chondrichthyes).

² The term "shark catchers" refers to countries, territories and other political entities that report shark catch to the FAO.

informed systems of fisheries management and governance overall. Many of the remaining Top 20 also have NPOAs, yet this analysis has failed to identify information that indicates that sharks are effectively managed. This suggests that the development of an NPOA may have become an end rather than the means. Further, seven of the Top 20 are currently without an NPOA-Sharks. Although this in itself cannot be interpreted as implying that sharks are, necessarily, poorly managed, this analysis has not been able to confirm the status of shark management arrangements in these Top 20 catchers.

Even where NPOAs exist, their structure, together with a failure to review and assess these plans periodically, makes assessment of their effectiveness difficult. More generally, the lack of publicly available information on shark fisheries and their management means that it is very difficult to assess whether the principles of the IPOA-Sharks have been adopted by the Top 20. It is equally difficult to determine whether this group has implemented the limited shark conservation and management measures adopted by the RFMOs in which they participate. Overall, however, this and previous reviews of implementation of the IPOA-Sharks have found little evidence that the IPOA-Sharks has contributed to significantly improved shark conservation and management outcomes.

Based on this initial analysis, recommendations for improved shark conservation and management by the Top 20 and RFMOs are provided below. These make it clear that there is a pressing need for a more detailed global review of progress by the Top 20 on the principles of the IPOA-Sharks. The recommended review should then inform the development of national, regional and international action to improve shark conservation and management. The global community cannot afford to wait for another decade in the hope that the IPOA-Sharks will

deliver the outcomes that the members of FAO expected when it was agreed upon. Additional action is required to ensure that the list of shark species threatened by overfishing does not continue to grow.

It is imperative that the 2011 meeting of COFI:

1. Recognizes that it is currently not possible to determine whether the Top 20 shark catchers are implementing the principles of the IPOA-Sharks.
2. Requests that the FAO undertake, as a priority, a review into the application of the principles of the IPOA-Sharks by the Top 20.
 - a. The review should be a comprehensive analysis of the actions being undertaken to manage fisheries in which sharks are taken through directed fishing or incidental catch.
 - b. The review should prioritize those Top 20 catchers for which the information available suggests that there is little or no management of shark fisheries in place, or for which there was insufficient information available to make an informed judgement about the level of management: Indonesia, India, Taiwan, Argentina, Mexico, Pakistan, Malaysia, Thailand, Brazil, Sri Lanka, Nigeria, Iran and South Korea.
3. Requests that the FAO conduct an audit of shark catch data provided by COFI members to assess the extent to which they conform to the FAO's reporting requirements.
4. Requests that the FAO report back to COFI 2013 on the above review and audit through a publicly available document with recommendations for further action and deadlines.
5. Agrees that, after consideration of that report, COFI will adopt an ongoing and transparent mechanism to monitor progress on the principles of the IPOA-Sharks for the Top 20 (noting that the composition of the Top 20 will change over time).

INTRODUCTION

TRAFFIC has reported on trends in the catch, trade and management of sharks over the past decade (see, for example, Lack and Sant, 2006; Lack and Sant, 2008). In particular, TRAFFIC has previously focused on identifying those countries and entities mainly responsible for global shark catch. However, it is the management of that catch, rather than merely its extent, that is important in determining the potential impact of catch on shark populations. TRAFFIC and the Pew Environment Group have, therefore, reviewed the reporting of catch and trade data and the conservation and management of sharks by the major shark catchers (the Top 20).

For each of the Top 20, the report considers:

- The catch and trade data reported to the Food and Agriculture Organization of the United Nations (FAO).
- The nature of their shark fisheries and management, including development and implementation of the FAO's International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks).
- The implementation of shark conservation and management measures required or recommended by regional fisheries management organizations (RFMOs) and other international conventions or organizations in which they participate.

In addition, the report:

- Discusses the objectives and principles of the IPOA-Sharks and responses to it.
- Makes recommendations for specific actions, with particular application to the Top 20, to improve the conservation and management of sharks.



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METHODS

The Top 20 were identified on the basis of the average of shark catch data reported to the FAO in the period 2000 to 2008. Drawing on publicly available information, individual profiles have been developed for each of the Top 20 to describe the nature and extent of their fisheries for, and their trade and management of, sharks (see Appendix 1). The profiles are intended to provide a snapshot of the available information on each of the leading shark catchers. The extent of readily accessible information varies considerably across the Top 20 and, as a result, the comprehensiveness of the profiles also varies. This highlights those areas where a better understanding of shark fisheries and management is required.

The major sources of information used in developing the profiles include:

- FAO Fishstat Capture Production 1950-2008 and Commodities Production and Trade 1976-2007 datasets.³
- Official import statistics, 2005-09, for the European Union (EU), Hong Kong (2008 only), Japan, South Korea, Taiwan and the United States.
- Official export statistics, 2005-09, for the EU, Japan, South Korea, New Zealand, Taiwan, and the United States.
- Shark catch data reported to RFMOs.
- Reports of meetings of RFMO bodies, including meetings of the commissions, scientific committees, ecosystem and bycatch committees and compliance committees.
- Published literature.

³ Available at www.fao.org/fishery/statistics/programme/3,1,1/en



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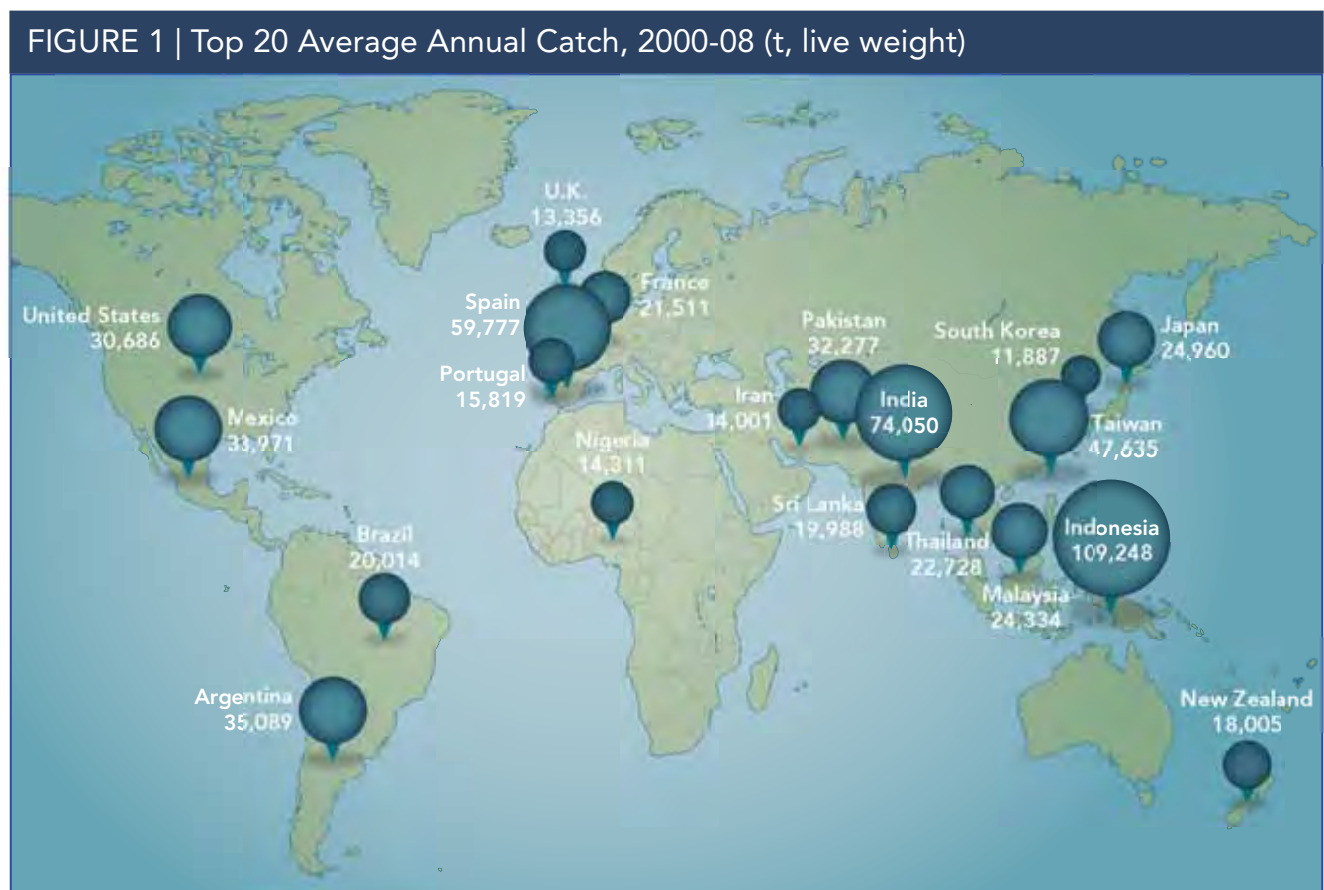
THE TOP 20

The Top 20 for the period 2000 to 2008 are listed in Table 1 (See also Figure 1). The Top 20 is an arbitrary construct and in considering this report, it is important to bear in mind that:-

- Although the Top 20 account for nearly 80% of total reported shark catch, the top four shark catchers (Indonesia, India, Spain and Taiwan) account for more than 35%.
- Five of the Top 20 (Portugal, Nigeria, Iran,

the United Kingdom and South Korea) each account for less than 2% of the global reported shark catch.

- The 20th-ranked catcher accounts for 1.4% of global reported shark catch, and six that are not in the Top 20 account for 1% or more of the catch: Canada (1.39%), Peru (1.21%), Yemen (1.17%), Australia (1.15%), Senegal (1.06%) and Venezuela (1.00%).



Source: FAO Fisheries Department (2010)

- The composition, ranking and catches of the Top 20 are determined by catch reported to the FAO. The extent to which that is an accurate reflection of the actual global catch of sharks depends on the level of under-reporting and nonreporting of shark catch by FAO members, the adherence of

members to the FAO's reporting guidelines, the catch of non-FAO members, and the extent to which sharks are reported as part of generic categories such as "marine fishes not elsewhere included (nei)" and "pelagic fishes nei."

Catcher	2000	2001	2002	2003	2004	2005	2006	2007	2008	Average Annual Catch	%Global Catch 2000-08
Indonesia	113,626	110,311	106,398	117,559	108,944	100,037	110,528	108,539	107,290	109,248	13.25
India	76,057	67,971	66,923	63,771	79,825	61,056	66,367	103,246	81,237	74,050	8.98
Spain	82,349	77,103	62,996	61,595	53,330	42,806	48,310	53,715	55,790	59,777	7.25
Taiwan	45,923	42,355	44,412	67,432	43,797	45,945	49,375	48,707	40,776	47,635	5.78
Argentina	25,750	31,784	26,251	31,691	32,038	37,161	40,325	44,343	46,461	35,089	4.26
Mexico	35,260	32,718	30,888	34,429	37,540	35,832	34,976	34,782	29,315	33,971	4.12
Pakistan	51,170	49,863	49,904	33,248	30,687	22,877	20,127	16,284	16,335	32,277	3.92
United States	30,935	22,072	24,076	35,372	30,732	29,793	32,004	34,287	36,906	30,686	3.72
Japan	31,873	27,696	32,879	25,537	23,475	25,930	22,795	16,212	18,249	24,960	3.03
Malaysia	24,521	25,209	24,167	27,948	25,053	25,094	22,240	21,764	23,011	24,334	2.95
Thailand	24,689	24,278	30,208	32,540	27,646	20,745	16,215	13,116	15,121	22,728	2.76
France	24,952	25,799	23,136	22,755	21,800	21,477	19,082	19,619	14,980	21,511	2.61
Brazil	21,585	20,408	21,737	20,849	20,046	23,753	18,392	17,239	16,121	20,014	2.43
Sri Lanka	34,380	29,400	32,753	32,838	26,559	7,610	7,700	4,248	4,410	19,988	2.42
New Zealand	17,718	19,796	21,238	18,459	16,647	18,032	16,783	17,409	15,965	18,005	2.18
Portugal	12,783	13,855	14,017	16,999	12,765	15,360	16,856	20,176	19,560	15,819	1.92
Nigeria	13,238	14,626	13,449	15,179	13,560	13,882	14,444	15,292	15,131	14,311	1.74
Iran	12,155	11,635	10,619	15,963	18,318	17,443	15,015	13,187	11,678	14,001	1.70
U.K.	17,389	19,346	16,832	19,581	16,232	10,625	7,982	6,442	5,779	13,356	1.62
South Korea	15,394	14,011	11,961	12,567	12,506	10,110	10,841	11,374	8,222	11,887	1.44
Top 20 Total	711,747	680,236	664,844	706,312	651,500	585,568	590,357	619,981	582,337	643,654	78.08
Global Reported Catch	889,117	862,880	864,137	900,151	850,415	773,689	753,110	789,282	736,491	824,364	

Source: FAO Fisheries Department (2010)

CONSERVATION AND MANAGEMENT OF SHARKS

IPOA-Sharks Obligations and Commitments

In 1994, because of concerns that trade in shark products was resulting in the over-exploitation of shark species, the Parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) requested through Resolution Conference 9.17, among other things, that FAO establish a program of work to collate biological and trade data on sharks in cooperation with all those using and trading shark products.⁴ In response, the FAO Committee on Fisheries (COFI) initiated an expert consultation on sharks and a series of regional and technical workshops that led, ultimately, to COFI's adoption in 1999 of the IPOA-Sharks (Oliver, Sant and

⁴ This resolution was updated in 2010 and is now Resolution Conference 12.6. (Rev. CoP15) (www.cites.org/eng/res/12/12-06R15.shtml).

Fowler, 1998) and the technical guidelines for implementation of the IPOA, which contain advice on the ideal content of a National Plan of Action for Sharks (NPOA-Sharks) (FAO, 2000). The implementation of the IPOA-Sharks by the 136 members of COFI is voluntary.⁵

The IPOA-Sharks recommends a process beginning with a review of shark catches, management and knowledge of species, policies and status of stocks. This is presented as a shark assessment report (SAR). Although the IPOA-Sharks recommends that an NPOA be prepared, it recognizes that an NPOA may not be necessary in all cases and recommends that the SAR be structured so as to guide a decision as to whether there is a need for action beyond what is already in place.

The FAO Secretariat reports to COFI on the

⁵ Taiwan is not a member of COFI because it is not a member of the United Nations.

The IPOA-Sharks recommends that the following 10 principles be applied in that decision:

1. Ensure that shark catches from directed and nondirected fisheries are sustainable.
2. Assess threats to shark populations, determine and protect critical habitats and implement harvesting strategies consistent with the principles of biological sustainability and rational long-term economic use.
3. Identify and provide special attention, in particular to vulnerable or threatened shark stocks.
4. Improve and develop frameworks for establishing and coordinating effective consultation involving all stakeholders in research, management and educational initiatives within and between States.
5. Minimize the unutilized incidental catches of sharks.
6. Contribute to the protection of biodiversity and ecosystem structure and function.
7. Minimize waste and discards from shark catches.
8. Encourage full use of dead sharks.
9. Facilitate improved species-specific catch and landings data and monitoring of shark catches.
10. Facilitate the identification and reporting of species-specific biological and trade data.

application of the IPOA-Sharks at the national and regional levels. The FAO's report is based on voluntary responses by COFI members to a biennial FAO questionnaire and includes an assessment of the development of SARs and NPOA-Sharks. However, the voluntary nature of the questionnaire means that some SARs/NPOAs may not be reported to COFI. In addition, these reports to COFI provide only numbers, rather than names of members, that have reported. Further, such reporting provides no indication of the extent to which the principles of the IPOA have been applied either through NPOAs or through other management measures. In 2009, the FAO reported to COFI that, of the one-third of COFI members that had responded to the FAO questionnaire, about 50% (34) had assessed the need for an NPOA and, of those, 90% had developed an NPOA (FAO, 2009a). The status of development of NPOAs by the Top 20 is outlined in Table 3. Currently, 13 of the Top 20 are known to have an NPOA-Sharks.

In 2005, the FAO organized an expert consultation that evaluated progress in the implementation of the IPOA-Sharks. The consultation concluded that "a few countries had made excellent progress in the implementation of national plans of action for the management and conservation of elasmobranchs [and] some of these equalled or exceeded what had been anticipated in the FAO document. In sad contrast, the majority of countries have not made progress in implementing effective fisheries management and conservation of their elasmobranch resources." (FAO, 2006) In 2008, FAO's Technical Workshop on the Status, Limitations and Opportunities for Improving the Monitoring of Shark Fisheries and Trade reconfirmed that slow progress in the implementation of the IPOA-Sharks was a major impediment to improving management and monitoring of shark fisheries in some of the main shark fishing nations (FAO, 2009b).

CITES Animals Committee assessments (2002a, 2002b and 2004) of NPOAs have focused on reviewing the content of the NPOAs in terms of their consistency with the requirements of the IPOA. However, since 2004, only one of the NPOAs of the Top 20 has been reviewed and revised, and thus these assessments generally still stand. The intent of this review was to consider the extent to which the Top 20 had implemented the "content" of their NPOAs, i.e., whether the NPOAs had delivered improvements in shark conservation and management in line with the principles of the IPOA-Sharks. However, it became apparent that available information is insufficient to make such an analysis. Although production of a SAR and NPOA may signify progress in identifying the issues that need to be addressed, examination of the available SARs and NPOAs reveals that they vary in terms of their comprehensiveness. Many do not contain specific actions or schedules for action, and most are not closely linked to the principles of the IPOA-Sharks. Assessment of their effectiveness against the IPOA is, therefore, very difficult. Although information is available about some catchers in terms of their progress in improving shark conservation and management since adopting NPOAs—for example, the United States, the United Kingdom (U.K.) and New Zealand—it is not possible to link or attribute this progress to the NPOAs.

In addition, there are a limited number of regional initiatives relating to shark management and conservation. These include:

- The EU Community Action Plan for the Conservation and Management of Sharks (CAP) adopted in February 2009 (EU, 2009).
- The development of an Action Plan for the Conservation of Cartilaginous Fishes (Chondrichthyans) in the Mediterranean Sea (United Nations Environment Program, 2003).



SHAWN HEINRICH

- The development of a Regional Plan of Action for Sharks (RPOA-Sharks) for Pacific Island Countries and Territories (Lack and Meere, 2009).
- Consultations, under the auspices of the Bay of Bengal Large Marine Ecosystem Project, among India, Sri Lanka, Bangladesh and the Maldives, to develop NPOA-Sharks and ultimately an RPOA-Sharks.
- RPOA-Sharks are in place or under development in Central and South America (Sanchez, 2010).

Some non-Top 20 shark catchers have also taken strong initiatives to protect or manage sharks as an integral part of formal fisheries management processes. For example:

- Palau announced in September 2009 that it would create the world's first shark sanctuary by banning all commercial shark fishing within its territorial waters.
- In February 2010, Honduras announced a moratorium on shark fishing and export of shark products until research has been

completed that will allow development of a responsible management plan.

- In March 2010, the Maldives extended a national ban on shark hunting, banning shark fishing in all its waters, protecting sharks and banning all shark product exports. This decision was based on evidence that sharks are more valuable as a tourist attraction than as exported meat and fins (Timms and Williams, 2009).
- Australia implemented an NPOA-Sharks in 2004 and is currently developing a revised plan. It has a number of target shark fisheries, each of which is subject to specific management arrangements and formal harvest strategies for key commercial shark species taken in Commonwealth-managed fisheries. Management measures in place in fisheries where sharks are taken, either as target or bycatch, include limited entry, total allowable catches, individual transferable quotas, closed seasons for nursery areas, minimum gillnet mesh size, closed areas, recreational bag limits and trip limits. Controls on finning have been introduced

in all State and Commonwealth fisheries. In Commonwealth fisheries, sharks must be landed with fins naturally attached, whereas State-managed fisheries require that fins on board do not exceed 5% of the weight of the shark carcasses on board. Australia has responded strongly to illegal, unreported and unregulated (IUU) fishing for sharks in its northern waters by foreign vessels.

RFMO Membership and Obligations

The Top 20 participate in a number of RFMOs (see Table 2) variously as contracting parties, cooperating noncontracting parties, entities or fishing entities. The relevant RFMOs for the purpose of this analysis are:

- The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR)⁶
- The Commission for the Conservation of Southern Bluefin Tuna (CCSBT)
- The International Commission for the Conservation of Atlantic Tunas (ICCAT)
- The Inter-American Tropical Tuna Commission (IATTC)
- The Indian Ocean Tuna Commission (IOTC)
- The General Fisheries Commission for the Mediterranean (GFCM)
- The Northwest Atlantic Fisheries Organization (NAFO)
- The North East Atlantic Fisheries Commission (NEAFC)
- The South East Atlantic Fisheries Organization (SEAFO)
- The South Pacific Regional Fisheries Management Organization (SPRFMO)
- The Western and Central Pacific Fisheries Commission (WCPFC)

⁶ It is acknowledged that CCAMLR is not a fisheries management organization. However, for convenience, a reference in this report to RFMOs includes a reference to CCAMLR.

Generally, the Top 20 are members of the relevant RFMOs. It is notable, however, that neither Indonesia nor Mexico is a full member of the WCPFC and that Taiwan, as a nonmember of the United Nations, cannot become a contracting party or noncontracting party to the IOTC, which is established under the FAO.

Because of their participation in these RFMOs, the Top 20 catchers have obligations to implement shark conservation and management measures that are adopted by these RFMOs. Each of the RFMOs, except the SPRFMO and the CCSBT, has some form of binding conservation and management measure in place for sharks.⁷ In summary, the measures most commonly in place across the RFMOs include:

- Retaining all parts of any retained sharks, except head, guts and skin, to the first point of landing.
- Controlling shark finning by requiring that the weight of fins at the first point of landing or transshipment does not exceed 5% of the weight of shark carcasses on board.
- Prohibiting the retention, transshipment, landing or trading of fins in contravention of the finning controls.
- Reporting data on shark catch (not mandatory in all cases and variable in extent).
- Encouraging release of live sharks taken as bycatch.
- Encouraging members to implement the IPOA-Sharks through development of an NPOA-Sharks.

⁷ Details of the measures in place can be found at the following websites: http://www.ccamlr.org/pu/e/e_pubs/cm/09-10/32-18.pdf; http://www.ccsbt.org/docs/pdf/meeting_reports/ccsbt_15/report_of_CCSBT15.pdf (Attachment 16); <http://www.iatcc.org/ResolutionsActiveENG.htm>; <http://www.iccat.int/en/RecsRegs.asp>; http://www.iotc.org/files/proceedings/misc/ComReportsTexts/resolutions_E.pdf; <http://www.nafo.int/about/frames/about.html>; <http://www.neafc.org/current-measures-list>; <http://www.seafo.org/welcome.htm>; <http://www.wcpfc.int/conservation-and-management-measures>.

Some RFMOs have adopted stronger and, in some cases, species-specific measures for sharks:

- CCAMLR has banned the targeting of sharks in the Southern Ocean until the effects of fishing them are assessed.
- IATTC requires purse seiners to release sharks unharmed to the extent practicable.
- ICCAT requires its members to:
 - o Reduce mortality in fisheries targeting porbeagle (*Lamna nasus*) and North Atlantic shortfin mako (*Isurus oxyrinchus*) until sustainable levels of harvest can be determined.
 - o Prohibit retention, transshipment, landing, sorting, selling or offering for sale any part or whole carcass of bigeye thresher (*Alopias superciliosus*); to release unharmed, to the extent practicable, bigeye thresher; and to report the number of discards of this species and their life status.
 - o Prevent the targeting of all species of thresher sharks of the genus *Alopias*.
- o Ban the retention of oceanic whitetip sharks (*Carcharhinus longimanus*).
- o Ban the retention of any hammerhead sharks (except bonnethead shark [*Sphyrna tiburo*]) caught in ICCAT fisheries. (Developing coastal countries may have coastal fisheries for this species for domestic consumption, but international trade of fins is prohibited.)
- IOTC prohibits retaining, transshipping, landing, sorting, selling or offering for sale any part or whole carcass of all species of the family Alopiidae and requires members to release unharmed, to the extent practicable, all species of that family.
- NAFO has established a total allowable catch (TAC) for thorny skate (*Ambyraja radiata*) in one fishing division.
- NEAFC has:
 - o Banned directed fisheries in the international waters of the NEAFC regulatory area for spiny dogfish (*Squalus acanthias*), porbeagle, and basking shark (*Cetorhinus maximus*).

TABLE 2 | Top 20 Participation in RFMOs

Catcher	CCAMLR	CCSBT	GFCM	IATTC	ICCAT	IOTC	NAFO	NEAFC	SEAFO	SPRFMO ¹	WCPFC
Indonesia		P				P					CNP
India	P					P					
Spain	P	CNP (EU)	P	P (EU)	P (EU)	P (EU)	P (EU)	P (EU)	P (EU)	S (EU)	P (EU)
Taiwan		P ²		P	CNP						P
Argentina	P										
Mexico				P	P						CNP
Pakistan						P					
United States	P			P	P		P				P
Japan	P	P	P	P	P	P	P	CNP	P		P
Malaysia						P					
Thailand						P					
France	P	CNP (EU)	P	P (OT)	P (OT)	P (OT)	P (OT)	P (EU)	P (EU)	S (EU)	P (OT)
Brazil	P				P						
Sri Lanka						P					
New Zealand	P	P						CNP		S	P
Portugal	P (EU)	CNP (EU)	P (EU)	P (EU)	P (EU)	P (EU)	P (EU)	P (EU)	P (EU)	S (EU)	P (EU)
Nigeria					P						
Iran						P					
U.K.	P	CNP (EU)	P (EU)	P (EU)	P (OT)	P (OT)	P (EU)	P (EU)	P (EU)	S (EU)	P (EU)
South Korea	P	P		P	P	P	P				P

Notes: CNP=Cooperating Noncontracting Party/Member; OT=Overseas Territories; P=Party/Member/Fishing Entity; P (EU)=Party through membership in the EU (may or may not be actively fishing in the RFMO Convention Area); S=Signatory; S (EU)=Signatory through membership in the EU.

1. Open for signature for one year from February 1, 2010, but has not yet entered into force.

2. Member of the Extended Commission.

- o Limited fishing effort (to 65% of the highest level in previous years) for deep-sea species, which include a number of shark species.

The SPRFMO is not yet in effect, and no shark-specific measures are included in the interim measures adopted. However, the interim measures do include a ban on the use of deepwater set gillnets, which are used to catch deepwater shark species as well as other teleosts.⁸ The CCSBT has adopted a nonbinding recommendation that members adhere to the requirements of the WCPFC and the IOTC when their vessels are operating in the relevant waters of those commissions.

An attempt has been made in the profiles to assess the extent to which the Top 20 have implemented these measures. However, this review did not have the capacity to request information from each Top 20 catcher.

⁸ Details of the measure can be found at <http://www.southpacificrfmo.org/assets/8th-Meeting-November-2009-New-Zealand/Interim-measures/Interim-Measure-for-Deepwater-Gillnets.pdf>

Further, the level and comprehensiveness of the publicly available information from RFMOs on implementation of, and compliance with, these measures is variable. Therefore it remains unclear in many cases whether domestic regulations or laws have been adopted to implement these measures, or how extensively complementary measures are applied in national waters. As a result, the assessment is opportunistic rather than comprehensive and is drawn largely from incidental references to particular members in reports of RFMO compliance committees and statements made by the members to the RFMOs or to national authorities. Thus Top 20 catchers that have not been identified as failing to meet some RFMO obligations cannot be assumed to be in compliance.

Although it is difficult to draw meaningful conclusions about Top 20 compliance with the relevant shark conservation and management measures, analysis of the available material does allow some general conclusions to be



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made about the measures applied by RFMOs and compliance with them:

- Many of the shark conservation and management measures are ambiguous (e.g., whether the carcass weight of the fin-to-carcass ratio relates to whole or dressed weight) and provide loopholes that can be exploited.
- Reporting of shark catch remains voluntary in some RFMOs (e.g., CCSBT, WCPFC and IATTC), and in such cases, a number of the Top 20 do not provide the recommended data.
- Some of the Top 20 do not provide mandatory data on sharks to the relevant RFMOs.
- In most cases, there is no comprehensive, publicly available reporting on compliance with RFMO conservation and management measures. This is true of all such measures, not only those relating to sharks, and is a serious failing of RFMO procedures.
- There is little to no accountability in RFMOs for noncompliance with the measures, including a lack of sanctions for noncompliance.

To improve shark conservation and management, it is recommended that RFMOs:

- Prohibit the targeting of sharks and the retention of live sharks until science-based management is implemented.
- In the absence of robust stock assessments for sharks, implement shark conservation and management measures based on ecological risk assessments.
- Abandon their reliance on fin-to-carcass ratios and immediately require all members to land sharks with fins naturally attached.
- Continue to adopt species-specific measures for particularly vulnerable or at-risk shark species.
- Address the mitigation of shark bycatch using gear-specific solutions.

- Mandate the provision of catch and effort data on sharks.
- Implement statistically robust observer programs.
- Establish comprehensive and transparent mechanisms for monitoring members' compliance with such measures.
- Adopt and implement sanctions for noncompliance.

Convention on International Trade in Endangered Species of Wild Fauna and Flora

As mentioned above, the parties to CITES adopted a resolution in 1994 regarding shark conservation and management. Since that time, there have been many decisions of the CITES parties regarding sharks and the agreement of a current resolution, Resolution Conference 12.6 (Rev. CoP15). Subsequently, the (now 175) parties to CITES have noted that COFI members were encouraged to have an NPOA-Sharks by 2001, that there was a significant lack of progress in implementing the IPOA-Sharks, and that insufficient progress has been made in achieving shark management through the implementation of the IPOA-Sharks. Specifically, CITES parties urged "FAO's COFI and RFMOs to strengthen their efforts to undertake the research, training, data collection, data analysis and shark management plan development outlined by FAO as necessary to implement the IPOA-Sharks." (CITES Resolution Conf. 12.6 [Rev. CoP15])

In addition, the parties to CITES have supported the creation of a memorandum of understanding (MoU) between CITES and the FAO. A number of sharks have been included in CITES Appendices (whale shark [*Rhincodon typus*], sawfish [*Pristidae* spp.]⁹ great white

⁹ *Pristidae* spp. are included in Appendix I of CITES except for *Pristis microdon*, which is in Appendix II and annotated to specify that

shark [*Carcharodon carcharias*] and basking shark), and species continue to be proposed for listing at meetings of the Conference of the Parties (CoP), with four shark proposals at the most recent CoP in 2010. The proposals (from the United States, the member states of the EU, and Palau) received a majority of votes but not the required two-thirds majority and as a result were not successful.

A common argument made by CITES parties opposed to the listings was that responsibility for ensuring adequate conservation and management of sharks rests with the FAO (although the FAO does not have a mandate to manage shark species or adopt conservation and management measures) and RFMOs. The continued concern expressed by many CITES parties at the lack of implementation of the IPOA-Sharks suggests that reliance on the voluntary implementation of the FAO's IPOA-Sharks has failed. Likewise, despite there having been many recommendations to CITES parties to adopt measures such as better catch and trade data reporting, response has been limited, because such recommendations are, like the IPOA-Sharks, nonbinding (CITES Animals Committee, 2004). Given this apparent unwillingness by many COFI members and CITES parties to respond to calls for voluntary action, it is not surprising that there is opposition to listing shark species on CITES, given the binding nature of such listings on CITES parties.

Convention on Migratory Species

In 2009, Convention on Migratory Species (CMS) members agreed to an MoU on the Conservation of Migratory Sharks that went

its inclusion in Appendix II is "for the exclusive purpose of allowing international trade in live animals to appropriate and acceptable aquaria for primarily conservation purposes." See <http://www.cites.org/eng/app/appendices.shtml>.

into effect in March 2010. The MoU applies to species listed in the CMS Appendices, which currently include whale shark, basking shark, great white shark, longfin mako (*Isurus paucus*), shortfin mako, porbeagle and the Northern Hemisphere population of the spiny dogfish. The current signatories to the MoU are Congo, Costa Rica, Ghana, Guinea, Kenya, Liberia, Palau, Philippines, Senegal, Togo, United States, Nauru and Tuvalu. The United States is the only Top 20 signatory to the MoU. A conservation plan, which will form an annex to the MoU, is currently in draft form and has yet to be agreed to by a meeting of the signatories. The MoU is nonbinding and aimed at increasing international coordination to ensure that action is taken to protect migratory sharks. While not all the Top 20 are members of CMS, the MoU is open to signing by nonmembers, and the extent of their catches would suggest the need for their participation in the drafting and implementation of the conservation plan if it is to have the best opportunity to achieve its objectives.



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ASSESSMENT

IPOA-Sharks Implementation

Based on the information contained in the profiles, a summary of the status of the implementation of the IPOA-Sharks is provided in Table 3.

The information in Table 3 indicates that:

- Thirteen of the Top 20 have an NPOA-Sharks: Argentina, Brazil, Japan, Malaysia, Mexico, New Zealand, Taiwan, Thailand and the United States have individual NPOAs, and France, Portugal, Spain and the U.K. are subject to the EU CAP.
- Of the individual NPOAs, only seven are posted on the FAO website, and each of these is available in only one of the three FAO working languages, reducing opportunities for assessing and comparing the NPOAs.
- Brazil's NPOA was not publicly accessible, and Thailand's NPOA could not be located on the FAO website or through Internet searches.
- Four of the Top 20 (Indonesia, India, South

Korea and Sri Lanka) are reported to be developing or finalizing or have sought assistance to develop NPOAs.

- Three of the Top 20 (Iran, Nigeria and Pakistan) are not known to have engaged in NPOA development.
- Only Japan is known to have reviewed and revised its NPOA.

This analysis suggests that shark fisheries are likely to be generally well managed in only a few of the Top 20 and, although NPOAs are in place in these countries/territories, there is no evidence to suggest that the NPOAs are responsible for the effective management of shark fisheries. It is possible to speculate that this is more likely to reflect generally better resourced and informed systems of fisheries management and governance overall. Many of the remaining Top 20 also have NPOAs, yet this analysis has failed to identify information that suggests that sharks are effectively managed. This suggests that the development of an NPOA may have become an end rather than the means. Further, seven of the Top 20 are currently without an NPOA-Sharks.

TABLE 3 | Review of the Status of Implementation of the IPOA-Sharks by the Top 20

Top 20 (% of Global Shark Catch)	Shark Assessment Report	NPOA-Sharks
Indonesia (13%)	Not explicitly	Draft (not accessed)
India (9%)	No	In development
Spain (7.3%)	Yes (EU)	Yes (CAP, 2009)
Taiwan (5.8%)	No	Yes (2004)
Argentina (4.3%)	Unknown	Yes (2009)
Mexico (4.1%)	Unknown	Yes (2004)
Pakistan (3.9%)	Unknown	Unknown
United States (3.7%)	Not explicitly	Yes (2001)
Japan (3.0%)	No	Yes (revised, 2009)
Malaysia (2.9%)	Yes (in NPOA)	Yes (2006)
Thailand (2.8%)	Unknown	Yes (2006; could not be accessed)
France (2.6%)	Yes (EU)	Yes (CAP, 2009)
Brazil (2.4%)	Unknown	Yes (2006; could not be accessed)
Sri Lanka (2.4%)	No	No (has sought assistance)
New Zealand (2.2%)	Not explicitly	Yes (2008)
Portugal (1.9%)	Yes (EU)	Yes (CAP, 2009)
Nigeria (1.7%)	Unknown	Unknown
Iran (1.7%)	Unknown	Unknown
U.K. (1.6%)	Yes (EU)	Yes (CAP, 2009)
South Korea (1.4%)	Unknown	Unknown (may be in progress)

Although this, in itself, cannot be interpreted to mean that sharks are poorly managed, this analysis has not been able to confirm the status of shark management arrangements.

As did previous assessments of the implementation of NPOAs, this analysis does not offer strong support for the contention that NPOAs have delivered more effective shark management. That is not to say that the principles and guidance provided by the IPOA-Sharks have not influenced shark management outcomes. Rather, the primary mechanism for delivery of the IPOA—the NPOAs—appears to be an issue.

It is time to reconsider the way in which the principles of the IPOA-Sharks are implemented and question whether the development of an NPOA is in fact the best response in all circumstances. Where there are well-regulated, sophisticated fisheries management regimes in place, the value added by development of an NPOA-Sharks may be minimal, although there remains the need to ensure that the principles of risk-based fisheries management are applied to sharks through specific management measures. However, where human and financial resources for fisheries management are limited, and governance arrangements and infrastructure are not well developed, the value of diverting resources to the development of an NPOA and the likelihood that such a plan can be successfully implemented are questionable.

This view is supported by the findings of an FAO technical workshop that agreed that many countries/territories were unable to fully meet all of the requirements of the IPOA and that a “more pragmatic, step by step approach toward the ultimate goal” might facilitate the achievement of the goals of the IPOA-Sharks (FAO, 2009b). This suggests that the focus should be on achieving the principles of the IPOA-Sharks rather than relying solely

on the development of an NPOA-Sharks to deliver the outcomes sought. There is a need to recognize that taking small, incremental steps is preferable to having an NPOA that is ambitious but not implemented or an NPOA that simply restates the IPOA-Sharks, without genuine political will for implementation. Focusing attention on such steps by the Top 20 will deliver the best outcomes for global shark conservation and management.

The following is recommended for the Top 20:

- In the absence of an NPOA, a SAR should be prepared and the precautionary approach applied.
 - Species-specific measures should be implemented to protect those species considered to be at highest risk.
 - Consideration should be given to a moratorium until such time as stock assessment and/or risk-based management has been implemented.
 - Measures such as release of live sharks, a requirement that sharks be landed with fins attached, and bycatch mitigation measures should be introduced.
 - Processes to collect and report information on the species composition of all catch should be implemented.
- Where NPOAs are being developed, these plans should be structured clearly around the principles of the IPOA-Sharks and prioritized to ensure that the most urgent issues are addressed.
- Where monitoring and management capacity is limited, the advice of the 2008 FAO technical workshop (FAO, 2009b) should be followed. That is, the priority should be to improve information about catches and life history parameters on a limited number of primary shark species. Those primary species should be identified based on the quantity taken; their socioeconomic importance to fishing communities; and other specific needs such as conservation concerns, including those

species included in the appendices of CITES.

- The FAO should ensure that all available NPOAs are available on the FAO website in the three working languages of the FAO to maximize opportunities for dissemination of approaches and to allow for assessment and comparison.
- Where NPOAs have been in place for more than four years, governments should assess their effectiveness and, based on the level of progress in shark conservation and management, determine whether an updated NPOA is required to meet the principles of the IPOA-Sharks.
- Where Top 20 catchers are involved in RPOAs, the plans should be formally adopted by the participants and, where appropriate, formally recognized by the relevant RFMOs.

The members of COFI agreed explicitly in the implementation section of the IPOA that all States should strive "...to have a *Shark-plan* by the COFI Session in 2001,"

that "States which implement the *Shark-plan* should regularly, at least every four years, assess its implementation for the purpose of identifying cost-effective strategies for increasing its effectiveness," and that "States should report on the progress of the assessment, development and implementation of their *Shark-plans* as part of their biennial reporting to FAO on the Code of Conduct for Responsible Fisheries." (FAO 1999). None of those elements of the IPOA-Sharks have been properly implemented.

There needs to be an urgent review of achievement on the principles of the IPOA-Sharks focused on the major shark catchers. This should be done through a structured reporting format so that, a decade from now, the global community does not find itself without any means of assessing the effectiveness of the IPOA-Sharks and confronted with an increasingly long list of endangered shark species.



Catch and Trade Data

Based on the information contained in the profiles, a summary of the status of catch and trade data reported to FAO by the Top 20 is provided in Table 4.

The data in Table 4 indicate the following:

- In reporting shark catch to the FAO:
 - Six of the Top 20 provide no shark species breakdown and provide all data in generic (nonspecies-specific) groups.
 - Eight provide data for a limited number of shark species (including three that report only one species separately) with all other data reported in generic categories.
 - Six provide an extensive species breakdown.
- In reporting shark trade to the FAO:
 - Thirteen of the Top 20 provide no shark species breakdown.
 - Five provide a very limited shark species breakdown.
 - Two provide a breakdown for all major species caught.

These results indicate a need for increased attention by all of the Top 20 to species identification of sharks in catch and/or trade. In particular, the Top 20 must ensure that the main shark species caught (those that make up 80% of shark catch) and traded are identified in domestic as well as FAO reporting of shark catch and trade. Additionally, specific Customs codes should be adopted to identify and distinguish between dried and frozen shark fins.

The analysis of the catch and trade of the Top 20 has revealed that the following countries/territories export shark products but do not currently report shark catch to FAO: Andorra, Austria, Czech Republic, Comoros, Federated States of Micronesia, Fiji, Jamaica, Kuwait, Marshall Islands, Myanmar, Palau, Papua New Guinea, Singapore, Slovakia, Tonga and Vietnam.¹⁰

¹⁰ Each of these, except for Singapore, is a member of the FAO. Andorra, Comoros, Federated States of Micronesia, Fiji, Jamaica, Marshall Islands, Myanmar, Palau, Papua New Guinea and Singapore are not members of COFI.

TABLE 4 | Review of the Status of Catch and Trade Data Reported to FAO by the Top 20

Top 20 (% of Global Shark Catch)	Species Breakdown of Catch	Trade Categories
Indonesia (13%)	Improving; One species and 12 species groups reported	No species reported
India (9%)	No species or species group reported	No species reported
Spain (7.3%)	Extensive	Very limited
Taiwan (5.8%)	No species or species group reported	No species reported
Argentina (4.3%)	Improving	Three species reported since 2008
Mexico (4.1%)	Limited	No species reported
Pakistan (3.9%)	No species reported	No species reported
United States (3.7%)	Extensive	Only dogfish specified
Japan (3.0%)	One species	No species reported
Malaysia (2.9%)	No species reported	No species reported
Thailand (2.8%)	No species reported	No species reported
France (2.6%)	Extensive	Very limited
Brazil (2.4%)	Limited	No species reported
Sri Lanka (2.4%)	One species reported	No species reported
New Zealand (2.2%)	Extensive	For major species
Portugal (1.9%)	Extensive	Very limited
Nigeria (1.7%)	No species reported	No species reported
Iran (1.7%)	Limited; covers main species	No species reported
U.K. (1.6%)	Extensive	Very limited
South Korea (1.4%)	Limited	No species reported

There are a number of possible explanations for apparent lack of reporting of shark catch by these countries/territories:

- Each reports fisheries catch to FAO (despite Singapore not being an FAO member), and it is likely that their shark catch is reported in other broad categories such as “marine fishes nei.” This may reflect either the way that a country/territory reports to FAO or the lack of specificity in its data collection procedures so that sharks are not identified separately in catch data.
- A country/territory can be identified as a source of shark imports as a result of importing and re-exporting and/or processing and exporting shark products, with zero or minimal catch of shark within its waters.

Of those countries/territories identified above, most export fewer than 200 tonnes of shark

products each year, according to the available trade data for the period 2005-09, with many averaging less than 10 t/year. Only four countries averaged exports of more than 200 t/year (Papua New Guinea (2,500 t), Vietnam (1,830 t), Singapore (3,700 t) and Myanmar (270 t). Of those, Singapore is known to be a minor catcher of sharks (South East Asia Fisheries Development Commission, 2010), and it imports, processes and exports shark fin products. The extent of shark catch and the reasons for nonreporting to FAO by Papua New Guinea, Vietnam and Myanmar warrant further investigation.

Management Issues

The information on the Top 20 catchers presented in the profiles (Appendix 1)



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has identified deficiencies and gaps in management and monitoring of shark catch and trade. Overall, the analysis indicates that:

- There is a need for urgent implementation of dedicated shark management measures to address overfishing in at least two of the Top 20.
- There is a need for an urgent assessment of shark fisheries and management to be initiated in at least five of the Top 20 so as to inform the development of effective management measures.
- In the absence of effective regulation of shark catch on the high seas by RFMOs, there is a need to prohibit the targeting of sharks by high seas vessels from eight of the Top 20 unless these fisheries are regulated under sustainable management arrangements.
- There is a need for adoption of enhanced shark bycatch mitigation measures in all Top 20 countries/territories.
- Eighteen of the Top 20 need to implement or extend regulations to require sharks to be landed with fins attached in all of their fisheries.
- Given the significance of the Top 20 catchers in shark catch and trade, there is a need for an increased focus on shark species identification in reporting on shark product types in trade.
- At least seven of the Top 20 need to improve their cooperation with and/or implementation of shark management measures introduced by RFMOs.
- At least four of the Top 20 need to ensure that they meet the shark data reporting requirements of the RFMOs in which they participate.



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CONCLUSION AND RECOMMENDATIONS TO COFI

The FAO has been at the forefront of efforts to ensure the conservation and management of sharks, having developed the IPOA-Sharks and associated guidelines. However, international concern about shark stocks continues to grow because of an increasing body of evidence that many shark species are threatened and are continuing to decline as a result of unregulated fishing. As is shown in this analysis, even the major shark catchers are generally not demonstrating that they are implementing the principles of the IPOA-Sharks, even though in some cases an NPOA-Sharks is in place. Given that a decade has passed since the IPOA-Sharks was agreed upon, TRAFFIC and the Pew Environment Group believe that the time has come to refocus the FAO's efforts on conservation and management of sharks.

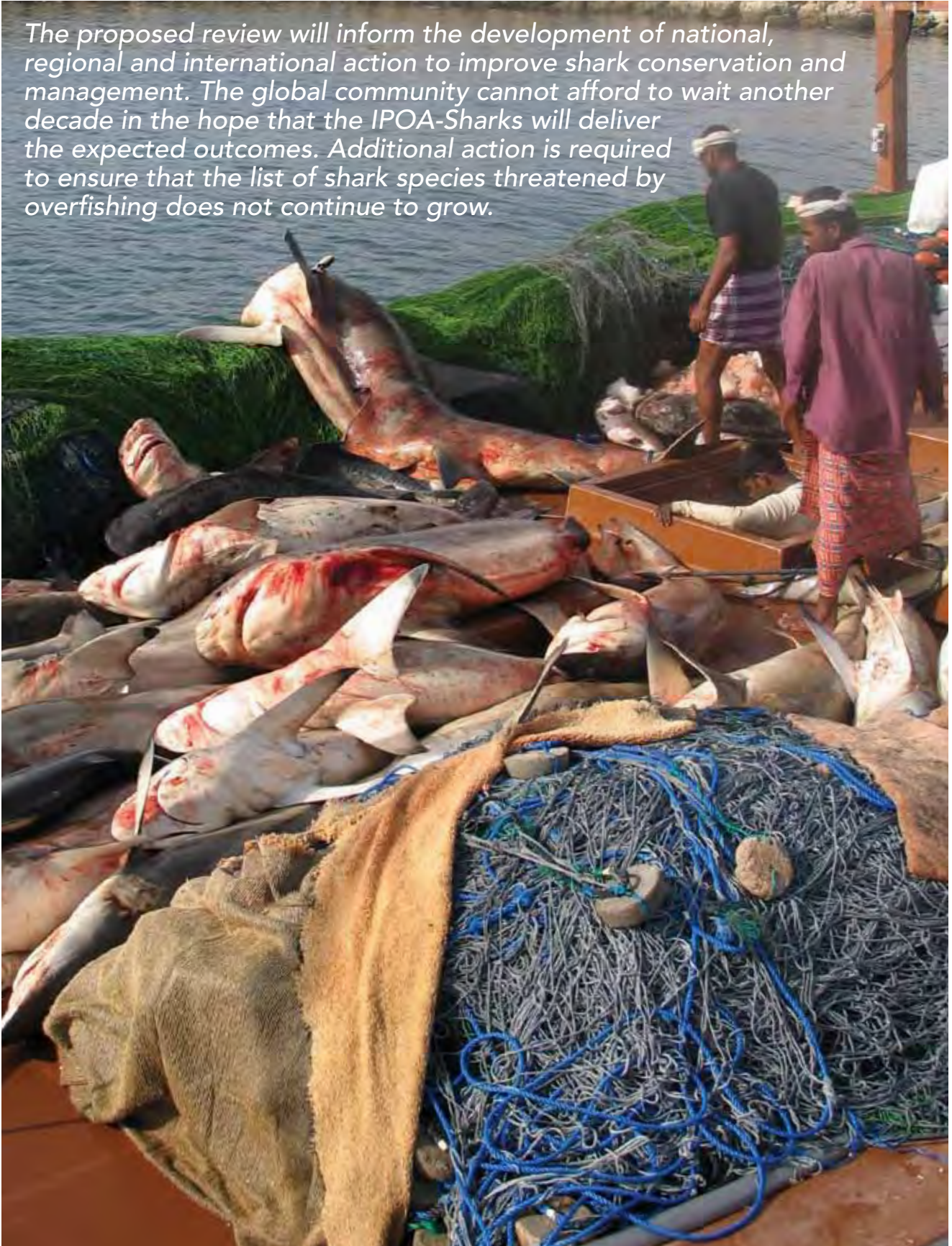
This review has highlighted a number of specific recommendations for action by the Top 20 and by RFMOs. These are not repeated in this section. Rather, the following recommendations focus on what can and should be done through FAO and COFI to improve the application of the principles of the IPOA-Sharks so as to enhance the status of shark populations.

Given that the Top 20 account for about 80% of global reported shark catch, the future sustainability of shark populations is effectively in their hands. Yet it is apparent that key Top 20 shark catchers, most of which are COFI members, have not adopted the recommendations of the IPOA-Sharks related to developing SARs and NPOAs or, more broadly, the principles of the IPOA-Sharks.

Given this, it is imperative that COFI at its 2011 meeting:

1. Recognizes that it is currently not possible to determine whether the Top 20 shark catchers are implementing the principles of the IPOA-Sharks.
2. Requests that the FAO undertake, as a priority, a review into the application of the principles of the IPOA-Sharks by the Top 20.
 - a. The review should be a comprehensive analysis of the actions being undertaken to manage fisheries in which sharks are taken through directed fishing or incidental catch.
 - b. The review should prioritize those Top 20 catchers for which the information available suggests that there is little or no management of shark fisheries in place, or for which there was insufficient information available to make an informed judgement about the level of management: Indonesia, India, Taiwan, Argentina, Mexico, Pakistan, Malaysia, Thailand, Brazil, Sri Lanka, Nigeria, Iran and South Korea.
3. Requests that the FAO conduct an audit of shark catch data provided by COFI members to assess the extent to which they conform to the FAO's reporting requirements.
4. Requests that the FAO report back to COFI 2013 on the above review and audit through a publicly available document with recommendations for further action and deadlines.
5. Agrees that, after consideration of that report, COFI will adopt an ongoing and transparent mechanism to monitor progress on the principles of the IPOA-Sharks for the Top 20 (noting that the composition of the Top 20 will change over time).

The proposed review will inform the development of national, regional and international action to improve shark conservation and management. The global community cannot afford to wait another decade in the hope that the IPOA-Sharks will deliver the expected outcomes. Additional action is required to ensure that the list of shark species threatened by overfishing does not continue to grow.



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ACRONYMS

BIOT	British Indian Ocean Territories
CAP	Community Action Plan (EU)
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
CCSBT	Commission for the Conservation of Southern Bluefin Tuna
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMS	Convention on Migratory Species
CNP	Cooperating noncontracting party
COFI	Committee on Fisheries
CPUE	Catch per unit effort
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GFCM	General Fisheries Commission for the Mediterranean
IATTC	Inter-American Tropical Tuna Commission
ICCAT	International Commission for the Conservation of Atlantic Tunas
IOTC	Indian Ocean Tuna Commission
IPOA-Sharks	International Plan of Action for the Conservation and Management of Sharks
IUU	Illegal, unreported and unregulated (fishing)
KITA	Korea International Trade Association
MoU	Memorandum of Understanding on the Conservation of Migratory Species (CMS)
MPA	Marine Protected Area
MSY	Maximum sustainable yield
NAFO	Northwest Atlantic Fisheries Organization
NEAFC	North East Atlantic Fisheries Commission
nei	Not elsewhere included
NMFS	National Marine Fisheries Service (U.S.)
NPOA-Sharks	National Plan of Action for the Conservation and Management of Sharks
QMS	Quota Management System (New Zealand)
RFMO	Regional fisheries management organization
RPOA-Sharks	Regional Plan of Action for the Conservation and Management of Sharks
SAR	Shark Assessment Report
SEAFO	South East Atlantic Fisheries Organization
SPRFMO	South Pacific Regional Fisheries Management Organization
TAC	Total allowable catch
TCC	Technical and Compliance Committee
UAE	United Arab Emirates
WCPFC	Western Central Pacific Fisheries Commission
WCPO	Western and Central Pacific Ocean

APPENDIX 1 - PROFILES

Profile Notes

A profile for each of the Top 20 shark catchers is provided below in rank order. The following notes are provided to assist in interpreting the information.

1. Shark catch is sourced from FAO Fishstat Capture Production 1950 to 2008 and represents the average shark catch reported from 2000 to 2008. Percentage of global catch is calculated by dividing the reported shark catch by the global reported shark catch.
2. Shark trade quantities are sourced primarily from the FAO Fishstat Commodities Production and Trade 1976-2007. Information on sources/destination of imports/exports and data on trade quantities for 2008-09 are identified mainly from official import and/or export statistics for the EU, Hong Kong (2008 only), Japan, South Korea, New Zealand, Taiwan and the United States.
3. A list of scientific names for each of the shark species mentioned in the profiles is provided in Appendix 2.

Indonesia	
Shark catch (% of reported global catch) and main species reported	109,000 t (13.3%) Before 2005, all catch was reported to FAO in only two species group categories. Currently, one species and 12 species groups are reported. Whitespotted wedgfish makes up 7% of the catch, "sharks, rays, skates etc., nei" about 30%, and "rays, stingrays, mantas, nei" 26%.
Shark trade	Indonesia reports exports to FAO in four categories: "Shark fins, dried, unsalted," "shark fins, salted and in brine but not dried or smoked," "sharks nei frozen," and "sharks, rays, skates, fresh or chilled, nei." In 2007, Indonesia reported exports of 1,600 t of frozen shark products, 800 t of dried fin, and 21 t of fresh/chilled shark products. Between 2005 and 2007, Indonesia accounted for 52% of exports of dried, unsalted shark fin. Dried shark fin from species including guitarfish and shovelnose rays is exported mainly to Japan, Hong Kong, Singapore, China, Malaysia and Taiwan. Surabaya (East Java) is the center of shark fin exports (FAO 2009). Indonesia was the fourth-largest supplier (681 t) of dried and frozen shark fin to Hong Kong in 2008 (Oceana 2010). Taiwan imports about 500 t/year of frozen shark product and relatively small quantities of frozen and dried shark fins from Indonesia (Ministry of Finance 2010). South Korea imports frozen rays (110 t/year) and shark liver oil (45 t/year) from Indonesia (KITA 2010).
Shark fisheries and management	The main species taken are whitespotted whiplay, cowtail stingray, whitespotted guitarfish (whitespotted wedgfish), silky shark, spottail shark, blue shark, scalloped hammerhead, pelagic thresher and shortfin mako. Sharks are taken as target species with gill and tangle nets, longlines and harpoons and as bycatch by tuna longlines, trawls, seine nets, trammel nets, hand lines and other bottom gear. The growth in shark and ray fisheries in Indonesia has outstripped its effective management, and there are few, if any, management strategies aimed at protecting shark resources (FAO 2009). In Raja Ampat archipelago, about 100 vessels (about 7 m in length) target sharks for fins, with small sharks landed for domestic consumption and larger shark carcasses discarded. These subsistence or traditional fishing vessels are not required to have fishing permits (Varkey <i>et al.</i> 2010). IUU shark fishing by Indonesian vessels in northern Australian waters was common over the past decade with routine finning of shark catch, but this IUU activity has been reduced significantly in recent years (Lack and Sant 2008).
NPOA	No NPOA in place. Indonesia was reported to be developing an NPOA in 2004, but confirmation of its status has not been possible. A five-year survey of shark landings in Indonesian ports conducted under an Australian-funded project constituted a partial shark assessment report.
RFMOs	CCSBT, IOTC, WCPFC (CNP)
Implementation of shark measures	It was not possible to confirm whether Indonesia requires its vessels to comply with the fin-to-carcass ratio mandated by the IOTC and the WCPFC. Indonesia, as required by IOTC Resolution 05/05, reports shark catch to IOTC. Reporting under the more detailed Resolution 10/02 has yet to be tested. Reporting of shark catch to CCSBT and WCPFC is not mandatory. The 2010 meeting of the WCPFC Technical and Compliance Committee noted that Indonesia had failed to include catch in its archipelagic waters in the 2000-09 catch data provided to the commission (WCPFC TCC 2010).
Participation in conventions	CITES, not CMS
Implementation of shark measures	In CITES, Indonesia has taken out a reservation on the Appendix II listing of basking shark and whale shark. Not a signatory to CMS Shark MoU

APPENDIX 1 - PROFILES

India	
Shark catch (% of reported global catch) and main species reported	74,000 t (8.9%) All catch reported in one category: "Sharks, rays, skates, etc., nei"
Shark trade	<p>Reports shark exports to FAO in four categories: "shark fillets, frozen," "shark fins, frozen," "sharks nei, fresh or chilled" and "sharks nei, frozen." From 2000 to 2007, exports averaged 305 t/year, of which frozen shark fins made up more than 70%. Exports have declined in recent years, averaging only 177 t from 2005 to 2007, of which frozen shark fins make up about 115 t.</p> <p>Almost all shark fins are exported, because domestic demand is limited. Fins are sold in large quantities from the Andaman Islands, where a commercial shark fishery has been established. Species preferred for fin export are smooth hammerhead, milk, spadenose and blacktip reef shark. Most fins are exported to Hong Kong and Singapore. Markets for other shark products are limited, but recently new markets have emerged, including the U.K., the United States, Malaysia, Germany and Taiwan (Verlecar <i>et al.</i> 2007). Import data from Taiwan indicate that India also supplies dried shark fin to the export market, and EU import data indicate that about 200 t/year of predominantly frozen shark products is imported from India.</p>
Shark fisheries and management	<p>Sharks account for about 60 to 70% of the elasmobranch catch. Common species include blacktip, spottail, whitecheek, blacktip reef, hardnose, tiger, spadenose, milk, and scalloped hammerhead (Verlecar <i>et al.</i>, 2007).</p> <p>Sharks are taken as bycatch in trawl and gillnet fisheries. Trawl nets account for 60% of shark landings and gillnets 38%. Finning of sharks is taking place on a large scale because of the increase in demand for shark fin (Verlecar <i>et al.</i> 2007). A review of shark CPUE from 1984 to 2006 indicates a sharp downward trend in CPUE in all regions but with most severe declines apparent on the west and east coasts, prompting Indian government scientists to conclude that the sustainability of some shark species was in doubt (John and Varghese 2009).</p> <p>Ten species of sharks and rays (whale shark, narrow sawfish, Pondicherry shark, Ganges shark, speartooth shark, Ganges stingray, freshwater sawfish, green sawfish, whitespotted guitarfish and porcupine ray) have been added to Schedule 1 of India's Wildlife (Protection) Act 1972. This listing precludes the hunting of these species.</p>
NPOA	No NPOA in place. An NPOA is reportedly under development with FAO assistance and is expected to be completed in 2011 (Pasha [TRAFFIC India] personal communication October 2010). In addition, a regional plan of action covering India, Bangladesh, Maldives and Sri Lanka is under consideration (John and Pillai 2009).
RFMOs	IOTC, CCAMLR (not active fisher)
Implementation of RFMO shark measures	It was not possible to confirm whether India requires its vessels to comply with the IOTC fin-to-carcass ratio. India, as required by IOTC Resolution 05/05, reports shark catch to the IOTC. Reporting under the more detailed Resolution 10/02 has yet to be tested.
Participation in conventions	CITES, CMS
Implementation of shark measures	Not a signatory to CMS Shark MoU

Spain	
Shark catch (% of reported global catch) and main species reported	60,000 t (7.3%) Reports catch to FAO in 50 categories including 33 species. Forty-seven percent of catch is blue shark, 20% "raja rays nei" and 13% "sharks, rays, skates, etc., nei."
Shark trade	Reports exports to FAO in eight categories, predominantly as "sharks nei frozen" and "sharks, fillets frozen." Shark fins are not identified separately. Spain reported imports of more than 11,000 t of frozen shark products to the FAO in 2007. The EU reports 10 categories of official shark trade, but fins are not reported separately. Spain's main export partners for frozen shark products are other EU members, Hong Kong, Singapore, Brazil and Uruguay (EC 2010a). Spain is the leading supplier of shark fins to Hong Kong, supplying 37% (2,646 t) of imports of dried and frozen fins in 2008 (Oceana 2010).
Shark fisheries and management	Spain's directed fisheries for sharks are 275 pelagic longline vessels mainly targeting swordfish, shortfin mako and blue shark; 5-6 bottom longliners targeting deepwater sharks in international waters; and 15-18 trawlers in the NAFO area fishing for rays. Spain's high-seas shark fisheries undertaken by its pelagic fleets are not adequately documented; their longline catches of oceanic sharks are as large as or larger than the catch of tuna and swordfish; and most longliners now also target sharks (EC 2010b). About 210 bottom trawlers and bottom longliners fishing in European waters and bottom trawlers in coastal areas of Spain capture deepwater sharks and rays as bycatch (FAO 2009). EU TACs are in force for porbeagle, spiny dogfish, skates and rays. TACs for porbeagle and spiny dogfish were set at zero in 2010. Council Regulation (EU) No. 23/2010 prohibits EU vessels from retaining on board, transshipping or landing basking shark and great white shark in all waters; angel shark in all EU waters; common skate, undulate ray and white skate in specific zones; and porbeagle in international waters. Council Regulation (EC) No. 1185/2003 prohibits shark finning but provides for the issue of special permits to allow for the removal of fins at sea so that fins and carcasses can be landed separately at different ports, on the condition that the weight of shark fins on board does not exceed 5% of the whole weight of the shark. Spain issues an average of 185 special permits each year and from 2003 to 2005, Spanish vessels with onboard processing permits caught an average of 87% of the total shark catch of the Spanish fleet (EC 2010b). The EU is consulting on options to amend the regulation. Options include requiring that all sharks be landed with fins naturally attached.
NPOA	The EU adopted a CAP for sharks in 2009. Spain is also a contracting party to the Barcelona Convention, which has developed an RPOA-Sharks for the Mediterranean.
RFMOs	CCAMLR, GFCM, IATTC, ICCAT, IOTC, NAFO, NEAFC, SEAFO, SPRFMO, WCPFC, CCSBT (CNP)
Implementation of shark measures	The special permits under which many Spanish vessels operate may not be in compliance with the intent of the fin-to-carcass ratio implemented by the RFMOs of which it is a member, because the ratio applied by these RFMOs relates to the weight of the shark on board (which is usually dressed weight rather than whole weight). However, the interpretation of the ratio is not specified in any of the RFMO measures, and ICCAT allows members to interpret the ratio as best suits the operations of their vessels. Spain has prohibited the catch, transshipment, landing and commercializing of all hammerhead sharks and thresher sharks by all types of fishing gear used by the Spanish fleet, regardless of where it operates (Government of Spain 2009).
Participation in conventions	CITES, CMS
Implementation of shark measures	Not a signatory to CMS Shark MoU

APPENDIX 1 - PROFILES

Taiwan	
Shark catch (% of reported global catch) and main species reported	48,000 t (5.8%) Taiwan reports shark catch to FAO in two categories, and 98% of the catch is recorded as “sharks, rays, skates nei.”
Shark trade	Taiwan is predominantly an exporter of shark products, although it regularly imports frozen shark meat and frozen and dried shark fins. Taiwan reports shark exports to FAO in seven categories, predominantly frozen sharks, frozen fillets, fresh chilled sharks, and dried and frozen shark fin. Taiwan’s official export data indicate that from 2005 to 2009, Taiwan exported about 65,000 t of shark meat products and 3,480 t of frozen, dried and canned fins. Shark meat exports went mainly to Uruguay, Vietnam, South Korea, Mexico and Australia. Dried shark fins were exported mainly to Hong Kong and China, and frozen fins to China and Singapore. In 2008, Taiwan was the third-highest supplier of shark fin to Hong Kong.
Shark fisheries and management	Shark catch (from high seas and domestic waters) peaked at 68,000 t in 2003 and fell to 33,000 t in 2009. About 85% of the catch is taken on the high seas. Taiwan records catch data for silky shark, blue shark, shortfin mako, young sharks, and skates and rays. Of the total recorded shark catch, 57% is reported as “shark,” and, of the three species identified, blue shark is the most common (Joyce Wu, TRAFFIC, <i>in litt.</i> to G. Sant, November 2010). Sharks are targeted by bottom longline and large-mesh driftnet and mid-water longline in the coastal and offshore shark fishery and are taken as bycatch in the tuna longline fishery. In the far seas, sharks are bycatch of tuna longline and trawl fisheries, and some longliners target shark. Most sharks taken in the distant water tuna longline fleet are blue (70-80%), mako, thresher, hammerhead and oceanic whitetip. These are predominantly landed in foreign ports (Fisheries Agency, Taiwan 2004).
NPOA	NPOA adopted in 2004. Due for review.
RFMOs	CCSBT (Extended Commission), IATTC, WCPFC, ICCAT (CNP). Taiwan is a significant fisher in the Indian Ocean but cannot become a member or cooperating nonmember of the IOTC, which is an FAO body, because it is not a member of any United Nations body.
Implementation of RFMO shark measures	Taiwan’s fishery regulations require its vessels to meet the requirements of the shark conservation and management measures of RFMOs. Vessels must transship and offload fins and carcasses together; must ensure that up to the first point of landing, the fin to whole-body weight is less than 5%; must report to the port state the weight of shark body and fin on board when entering and leaving ports, as well as the weight of shark fin and carcass offloaded in port. Sanctions are in place for failure to comply with these requirements (Taipei Economic and Cultural Office in Guam 2008). Taiwan has enhanced its port inspection regime to ensure compliance with the 5% fin-to-carcass ratio required by the WCPFC; has made provision for recording of catch of 10 species of sharks in its WCPFC logbooks; and requires live sharks taken as bycatch to be released and to be recorded (CCSBT 2007 and 2010). Taiwan’s application of the fin-to-carcass ratio may not be compliant with the intent of the IATTC and WCPFC finning controls, because the ratio applied by these RFMOs relates to the weight of the shark on board (dressed weight rather than whole weight). However, the interpretation of the ratio is not specified in any of the RFMO measures, and ICCAT leaves the interpretation open to its members (ICCAT Compliance Committee 2010).
Participation in conventions	Neither CMS nor CITES
Implementation of shark measures	

Argentina	
Shark catch (% of reported global catch) and main species reported	35,000 t (4.3%) Reports catch to FAO in 12 categories, of which nine are species-specific. "Rays, stingrays, mantas nei" make up 58%, narrownose smoothhound 24% and Argentine angel shark 11%.
Shark trade	Reports exports to FAO in five categories, most of which consist of "shark, dried, salted or in brine." Exports averaged about 655 t/year in 2005-07. The FAO data suggest that despite being the fifth-largest catching country/territory, Argentina is a minor exporter. Export data presented by Sanchez (2010), however, suggest that there has been a significant increase in total shark exports since 2006 to about 11,000 t because of reported exports of frozen skates and rays, which had previously been reported as "other fish." Argentina has improved its trade statistics significantly. Since 2008, shark exports have been reported for 28 categories, of which 21 relate to different product forms of three species (narrownose smoothhound, school shark and spiny dogfish). Argentina exports frozen and dried shark fin to Hong Kong. In 2008, these exports were around 185 t (Oceana 2010). The EU imports about 500 t/year of shark products from Argentina, and the United States also imports small quantities.
Shark fisheries and management	There are about 35 species of sharks in the Argentine Sea. Three species (narrownose smoothhound, school and copper) are subjected to directed fishing. Other species of commercial importance are the angel shark, the tiger sand shark and several species of skates and rays. The most important directed shark fishery in the southwest Atlantic is the Necochea gillnet fishery for school shark, carried out by the coastal fleet. The Puerto Quequén coastal bottom trawl fishery also takes sharks, of which 14 are commercial species (Chiaromonte 1998 and 2006). Argentina has prohibited finning; adopted best practices for the handling of sharks (e.g. release of specimens larger than 1.6 m; banning the use of gaffs); set a maximum shark/ray bycatch of 40%; closed nursery areas; and closed areas to recreational fishing. Argentina has increased the number of shark species recorded by fishers from five in 2003 to 19 in 2009 (Sanchez 2010).
NPOA	NPOA adopted 2009 (available only in Spanish) underpinned by a series of multidisciplinary workshops (Sanchez 2010).
RFMOs	CCAMLR
Implementation of RFMO shark measures	Unknown
Participation in conventions	CITES, CMS
Implementation of shark measures	Not a signatory to CMS Shark MoU

APPENDIX 1 - PROFILES

Mexico	
Shark catch (% of reported global catch) and main species reported	34,000 t (4.1%) Reports shark catch to FAO in 12 categories, eight of which are species-specific. Fifty-eight percent of catch is reported as "sharks, rays, skates, etc., nei" and 21% as "rays, stingrays, mantas, nei."
Shark trade	FAO export data indicate that Mexico is a minor shark exporter with an average of 255 t of shark product exports over the 2005-07 period. Since 2000, exports have been recorded in only two categories: "Sharks, nei, fresh or chilled" and "sharks nei, frozen." Hong Kong imported 217 t of frozen and dried shark fin from Mexico in 2008 (Oceana 2010), and the United States imports about 170 t/year of shark products from Mexico (Personal communication from the National Marine Fisheries Service (NMFS), Fisheries Statistics Division, Silver Spring, Md., October 2010).
Shark fisheries and management	Mexico takes sharks (mainly mako sharks discarded dead) as bycatch in its tuna longline fishing operations in the Gulf of Mexico (ICCAT SCRS 2010). Mexico introduced an Official Norm for Responsible Shark and Ray Fisheries in 2006 under which landing of shark fins without carcasses on board is prohibited; catch and retention of whale shark, basking shark, great white shark and big skate is banned; closed and exclusion zones are in place; detailed logbooks to record retained species and an observer program are required; driftnets are banned (Barriera 2008).
NPOA	Plan approved in 2004 (Barriera 2008). Available in Spanish only. Due for review.
RFMOs	IATTC, ICCAT, WCPFC (CNP)
Implementation of RFMO shark measures	Mexico was given a catch exemption of 110 bigeye thresher sharks from the ICCAT ban on retention and landing of that species. IATTC observer reports indicate that Mexico took 11,128 sharks in its purse seine fleet (38% of the total reported observed purse seine take by IATTC vessels) in 2009. Of those, 99.7% were retained. This compares with an average retention rate of 53% across the IATTC purse seine fleet and suggests that the requirement of the IATTC to "release to the extent practicable, all sharks taken as bycatch" is not being applied by Mexico. In addition, 10 sharks on three trips on Mexican vessels were noted by observers to be finned (IATTC 2010). Although Mexico bars the landing of sharks unless the bodies are on board, it is not clear whether the 5% fin-to-carcass ratio is applied.
Participation in conventions	CITES, not CMS
Implementation of shark measures	The Mexican Official Norm on Environment Protection: Mexican Native Flora and Fauna Species-Risk Categories and Specification includes basking, great white and whale shark as threatened species. Not a signatory to CMS Shark MoU

Pakistan	
Shark catch (% of reported global catch) and main species reported	32,000 t (3.9%) Reports shark catch to FAO in four categories that are not species-specific. Fifty-five percent of the catch is reported as "requiem sharks, nei" and 42% as "rays, stingrays, mantas, nei."
Shark trade	Pakistan reports minor quantities of shark exports to FAO; since 2005, these have not exceeded 2 t. Before 2003, Pakistan was reporting exports of shark fin of about 90 t/year. Hong Kong import data for 2008 indicate that 40 t of frozen and dried shark fins were imported from Pakistan that year. Recent anecdotal reports suggest that Pakistan exports shark fins predominantly to Hong Kong and Singapore and that some of the shark fin exported from Pakistan is smuggled into Pakistan from Iran (Aslam 2010, Ilyas 2010).
Shark fisheries and management	Recent reports suggest that sharks are being heavily fished for their fins, and there is concern that shark stocks are declining. Shark landings are reported to have declined from 32,000 t in 1999 to 6,000 t in 2009. Sharks are taken mainly with hooks and bottom-set gillnets and include species such as hammerhead, grey bamboo, blacktip, pelagic thresher and spadenose sharks. The same reports indicate that finning is not practiced and that the carcass is retained (Aslam 2010, Ilyas 2010).
NPOA	May be developing an NPOA (Cavanagh <i>et al.</i> 2008), but its status could not be confirmed.
RFMOs	IOTC
Implementation of RFMO shark measures	The IOTC has identified Pakistan's artisanal fisheries as a major shark catching fleet from which historical catch and effort data are required. It is unclear whether Pakistan has implemented the 5% fin-to-carcass ratio required by IOTC. However, given the reports of full utilization of sharks, it is possible that the ratio is not required.
Participation in conventions	CITES, CMS
Implementation of shark measures	Not a signatory to CMS Shark MoU

United States	
Shark catch (% of reported global catch) and main species reported	31,000 t (3.7%) Reports catch to FAO in 30 categories, including 22 species. Forty-eight percent of catch is reported as "raja rays, nei," 30% as picked dogfish, 7% as Portuguese dogfish and 5% as "dogfishes and hounds nei."
Shark trade	Reports exports to FAO in six categories, with "frozen and fresh/chilled dogfish" making up about two-thirds of shark exports since 2000. Dried shark fin exports fell from nearly 500 t in 2003 to 36 t in 2007. Exports of frozen fin are not reported separately. The United States accounted for about 35% of total reported exports of frozen dogfish from 2005 to 2007. The United States also imports about 1,100 t of shark products, predominantly as fresh/chilled dogfish and other sharks. Frozen shark fin is not identified separately in U.S. trade data. However, Hong Kong import data indicate that in 2008, 251 t of dried and frozen shark fins were imported from the United States in 2008 (Oceana 2010). Given that only 8 t of dried fin were identified in the U.S. export data as exported to Hong Kong that year, it is assumed that the majority of fins is exported as frozen product and is included in the U.S. data as "sharks, frozen, nei."
Shark fisheries and management	The United States has target fisheries for species including spiny dogfish, sandbar, blacktip, Atlantic sharpnose, blacknose, finetooth, common thresher and shortfin mako shark. In the Atlantic, skates and rays are predominantly taken by otter trawling. Reported landings have increased in recent years, partly in response to demand as lobster bait domestically and to export demand for skate wings (FAO 2009). U.S. landings data indicate that in 2009, skates made up 24,000 t of the total shark catch of 33,000 t (NMFS 2010). Sharks are also taken as bycatch by the commercial tuna and swordfish fisheries and trawl fisheries. Sharks in U.S. federal waters are managed under eight federal fisheries management plans. In 2008, the U.S. reported that of its 35 identified shark stock/complexes, four were subject to overfishing and four were overfished, and the status of about 20 others was unknown or unidentified (NMFS 2009). Shark finning was banned in U.S. Atlantic fisheries in 1993, and this ban was extended nationally in 2000. As of 2008, all sharks in the Atlantic Highly Migratory Species Fishery must be offloaded with fins naturally attached.
NPOA	NPOA in place since 2001. Due for review.
RFMOs	CCAMLR, IATTC, ICCAT, NAFO, SPRFMO, WCPFC, NEAFC (CNP)
Implementation of RFMO shark measures	The United States provides Task I and Task II data in accordance with ICCAT requirements; sets and tracks annual quotas for shortfin mako sharks to ensure that the catch is within the U.S. designated quota; and has catch limits in place for Atlantic porbeagle, shortfin mako and blue sharks. The U.S. fulfills the requirements of recommendations related to finning through the Shark Finning Prohibition Act of 2000, the Shark Conservation Act of 2010 and the requirement that sharks taken in the Atlantic Ocean, including the Gulf of Mexico, be landed with fins naturally attached. Consistent with Rec. 07-06, the U.S. reduced the porbeagle quota in 2008 from 91 t to 1.7 t and implemented a rebuilding plan. It has prohibited the harvest of bigeye thresher sharks since 1999 (U.S. Department of Commerce 2010).
Participation in conventions	CITES, not CMS
Implementation of shark measures	The U.S. Fish and Wildlife Service uses a variety of material at ports to identify live sharks and parts or derivatives for species listed in CITES (FAO 2009). Signatory to CMS Shark MoU

APPENDIX 1 - PROFILES

Japan	
Shark catch (% of reported global catch) and main species reported	25,000 t (3.0%) Reports catch to FAO in three categories, of which one is species-specific. "Sharks, rays, skates, etc., nei" make up 85% of reported catch and whip stingray 15%.
Shark trade	Has reported exports to FAO in four categories since 2000, averaging about 4,400 t/year and consisting largely of "sharks nei, frozen" and "shark fillets frozen." There is no shark species identification in Japan's current trade codes. It exports mostly frozen shark meat and dried shark fins, with exports of shark meat going mainly to South Africa, Spain, Peru, China, South Korea and Vietnam (although most of the exports to South Africa, Spain and Peru are considered landings at foreign ports), and dried shark fin is exported mainly to Hong Kong, China and Singapore. Japan's export data indicate that dried fin exports averaged about 170 t/year from 2005 to 2008, with the bulk of these exports going to Hong Kong. Japan imports shark meat mainly from Spain, Canada, China, Indonesia, Taiwan, Vanuatu and South Korea. Imports averaged 928 t from 2005 to 2008 but in 2009 fell to just over 600 t (Japan Ministry of Finance 2010).
Shark fisheries and management	Japan's pelagic longline fisheries take sharks in both targeted shark operations and as bycatch to tuna fishing operations, with fins and meat retained or carcasses discarded depending on the nature of the fishing operation (Gillman <i>et al.</i> 2007). Pelagic shark species are taken primarily by the tuna longline fleet, and demersal sharks and rays by the bottom trawl fishery. Japan's catches declined from about 70,000 t in the 1950s to about 20,000-30,000 t in the 1990s, mainly because of the decline in landings of demersal sharks and rays from the bottom trawl fishery. Blue shark is the most common species taken in the tuna longline fishery and is mostly landed in overseas ports. Shortfin mako is often landed in Japan by the tuna longline fleet because of its high-quality meat. Salmon shark is mainly landed from coastal waters and is used for meat and fins, and skins are used for handicrafts (FAO 2009).
NPOA	Adopted in 2001 and revised in 2009.
RFMOs	CCAMLR, CCSBT, IATTC, ICCAT, IOTC, NAFO, SPRFMO, WCPFC, GFCM, NEAFC (CNP), SEAFO
Implementation of RFMO shark measures	Fishers are required to comply with the management measures of RFMOs through conditions imposed on fishing licenses (Fisheries Agency Government of Japan 2009). Japan has banned shark finning by Japanese vessels except for far seas and coastal vessels operating and landing outside Japanese waters (Camhi <i>et al.</i> 2009). In 2009, the IOTC Scientific Committee noted that Japan does not report on non-IOTC species such as sharks, and Japan opposed the adoption of an extended list of shark species to be reported on in IOTC logbooks (IOTC Scientific Committee 2009). In 2007, Japan reported to CCSBT that it did not have specific mitigation measures in place for sharks at that time but that it was monitoring shark populations in accordance with its NPOA-Sharks and implied that it applied the 5% fin-to-carcass ratio required by WCPFC and IOTC (CCSBT 2007). Japan has argued in CCSBT that the RFMO does not have a mandate to manage ecologically related species such as sharks. Japanese fishing vessels are complying with SEAFO's Conservation Measures (SEAFO Compliance Committee 2009).
Participation in conventions	CITES, not CMS
Implementation of shark measures	In CITES, Japan has taken out a reservation on the Appendix II listing of whale shark, basking shark and great white shark Not a signatory to CMS Shark MoU

Malaysia	
Shark catch (% of reported global catch) and main species reported	24,000 t (2.9%) Reports shark catch to FAO in two categories, of which "rays, stingrays, mantas, nei" make up 66% and "sharks, rays, skates, etc., nei" make up 34%.
Shark trade	Malaysia is a net importer of shark fin products. From 2000 to 2007, imports averaged about 600 t but increased in the 2005-07 period to average about 1,100 t. Most of this increase has been attributed to increased imports of prepared or preserved shark fin product. Malaysia is a minor exporter of shark products, averaging about 200 t from 2000 to 2007. Shark fins make up the bulk of these exports (about 80%). Malaysia's trade data do not identify shark species.
Shark fisheries and management	Malaysian landings of sharks and rays have increased rapidly since the late 1980s. Sharks are taken mainly by trawl and gillnet fisheries, with small quantities taken in longline, purse seine and other fisheries. The landings make up less than 2.2% of total marine landings. Sharks are not targeted by fishers but are caught with other commercially important species. Landings data indicate that the most dominant species of shark taken are longtailed carpet and requiem sharks, and the most common rays are whiptail stingrays. All parts of the shark are utilized, with fins exported to Hong Kong and Singapore, meat sold fresh or salted, and noncommercial species sold to fish mill factories for fertilizers or used as bait for fish and crab traps. Jaws and teeth are sold as souvenirs (Department of Fisheries Malaysia 2006). Malaysian fisheries are managed under the Fisheries Act 1985. However, there is no specific regulation pertaining to the management of sharks and rays except for whale shark, which is protected under the Fisheries (Control of Endangered Species of Fish) Regulations 1999. There is no regulation pertaining to freshwater shark and ray management, which is under the jurisdiction of the states.
NPOA	Implemented in 2006.
RFMOs	IOTC
Implementation of RFMO shark measures	The IOTC Scientific Committee has identified the need for Malaysia to collect catch and effort information for shark species from its longline tuna fleet and to report this information to the commission. It was not possible to determine whether Malaysia applies the 5% fin-to-carcass ratio required by IOTC.
Participation in conventions	CITES, not CMS
Implementation of shark measures	Not a signatory to CMS Shark MoU

Thailand	
Shark catch (% of reported global catch) and main species reported	23,000 t (2.8%) Reports catch to FAO in two categories, of which "rays, stingrays, mantas, nei" makes up 59% and "sharks, rays, skates, etc., nei" makes up 42%.
Shark trade	Thailand has reported exports to FAO in four categories since 2000. From 2000 to 2006, Thailand reported low levels of shark exports averaging about 110 t, most of which was classified as "sharks nei, frozen" and "shark fins dried, salted." However, in 2007, Thailand reported exports of preserved or prepared shark fins totaling 13,000 t. Thailand is a minor importer.
Shark fisheries and management	Sharks are taken by a wide range of gears, including trawl, gillnet, hook and line, and purse seine. Species taken include brownbanded bamboo, grey bamboo, slender bamboo, whitespotted bamboo, spottail, bull, Caribbean reef, pigeye, scalloped hammerhead, thresher and pelagic thresher sharks (FAO 2004). All parts of the sharks are fully utilized, with meat used mainly domestically and dried fins exported. There are no shark-specific management policies except for whale shark. However, the Thai Department of Fisheries regulates fisheries that take sharks through the established fishing methods and conservation areas (CITES Animals Committee 2009).
NPOA	Adopted in 2006 (CITES Animals Committee 2009).
RFMOs	IOTC. Thailand has applied for CNP status to WCPFC for the purposes of contributing data exchange but does not intend to fish in the convention area (WCPFC TCC 2010)
Implementation of RFMO shark measures	It was not possible to confirm whether Thailand applies the 5% fin-to-carcass ratio as required by IOTC.
Participation in conventions	CITES, not CMS
Implementation of shark measures	Not a signatory to CMS Shark MoU

APPENDIX 1 - PROFILES

France	
Shark catch (% of reported global catch) and main species reported	22,000 t (2.6%) Reports catch in 37 categories, including 26 species. Small spotted catshark makes up 26% of the reported catch, "raja rays nei" 15% and cuckoo ray 11%.
Shark trade	Imports have averaged about 4,000 t/year since 2000, composed predominantly of frozen dogfish and sharks. Exports average about 1,300 t/year, are reported in eight categories and consist predominantly of fresh/chilled sharks and dogfish (<i>Squalidae</i>). EU trade data indicate that shark product imports are sourced mainly from other EU members such as the U.K., Spain and Portugal as well as the United States, Canada and New Zealand. Exports are mainly to other EU member countries. France does not appear to have significant exports of shark fins, with less than 1 t of fins from France imported to Hong Kong in 2008.
Shark fisheries and management	French vessels target sharks using gillnets and take sharks as bycatch in fisheries targeting tunas by longline and purse seine. France does not issue special fishing permits to allow finning under the derogation permitted by EU Regulation (EC) No. 1185/2003 and requires fins to be landed naturally attached to the carcass (EC 2010b). EU TACs are in force for porbeagle, spiny dogfish, and skates and rays. TACs for porbeagle and spiny dogfish were set at zero in 2010. Council Regulation (EU) No. 23/2010 prohibits EU vessels from retaining on board, transshipping or landing basking shark and great white shark in all waters; angel shark in all EU waters; common skate, undulate ray and white skate in specific zones; and porbeagle in international waters.
NPOA	The EU adopted a CAP in 2009. France is also a contracting party to the Barcelona Convention, which has an RPOA-Sharks for the Mediterranean Sea.
RFMOs	CCAMLR, GFCM, IATTC, ICCAT, IOTC, NEAFC, SPRFMO, CCSBT (CNP). Also a party to NAFO and SEAFO through EU membership but not active in these fisheries.
Implementation of RFMO shark measures	France requires fins to be landed naturally attached (EC 2010b) and meets and exceeds the finning requirements of RFMOs.
Participation in conventions	CITES, CMS
Implementation of shark measures	Not a signatory to CMS Shark MoU

Brazil	
Shark catch (% of reported global catch) and main species reported	20,000 t (2.4%) Reports catch in 10 categories, of which eight are species-specific. "Sharks, rays, skates, etc., nei" make up 50%, "rays, stingrays, mantas, nei" 32% and blue shark 10%.
Shark trade	Exports are reported to FAO in five categories and averaged 100 t/year from 2000 to 2007; this has increased to about 155 t/year since 2005. Dried, salted shark fins make up most of the exports. Hong Kong import data indicate that more than 200 t of frozen and dried shark fin was imported from Brazil in 2008 (Oceana 2010).
Shark fisheries and management	Brazil takes sharks in its longline tuna fleet. In 2008, blue shark accounted for about 18% of the total longline catch and was the third-most commonly caught species. Brazil is working with EC scientists to develop spatial and technical management measures to reduce the bycatch of pelagic sharks by pelagic longliners (ICCAT 2010). Brazil prohibits landing of shark fins without the corresponding carcasses. The total weight of fins cannot exceed 5% of the total weight of carcasses; all carcasses and fins must be unloaded and weighed, and the weights must be reported to the authorities (Shark Coalition 2010). The fin-to-carcass ratio is applied to the whole weight of the shark (Camhi et al. 2009). Brazil apprehended a shipment of frozen fins being exported to Japan and fined the exporter and fishing vessel operators in 2010 because of irregularities in the catch documentation (Feitosa 2010).
NPOA	Reportedly drafted in 2006. Appears to be available (restricted access and in Portuguese) on the website of the Brazilian Society for the Study of Elasmobranchs (www.sbeel.org.br/)
RFMOs	CCAMLR (not active), ICCAT
Implementation of RFMO shark measures	Implements the 5% fin-to-carcass ratio requirement of ICCAT.
Participation in conventions	CITES, not CMS
Implementation of shark measures	Not a signatory to CMS Shark MoU

Sri Lanka	
Shark catch (% of reported global catch) and main species reported	20,000 t (2.4%) Reports catch to FAO in two categories, of which "sharks, rays, skates, nei" makes up 79% and silky shark makes up 21%.
Shark trade	Reports exports to FAO in four categories, but shark exports are limited and for most of the current decade have been less than 10 t/year. However, exports increased to more than 100 t in 2006 and 2007, consisting mainly of dried fin and fresh/chilled shark products. Sri Lanka reports (FAO 2009) that it exports shark fins mainly to Hong Kong, Malaysia, China, Singapore, Taiwan and Mauritius and that fin exports have ranged from 119 t in 2000 to 67 t in 2007. These data do not correspond with export data reported to FAO, which indicate no exports of fins from 2000 to 2005, and 70 t and 43 t, respectively, in 2006 and 2007.
Shark fisheries and management	Sharks are taken as target species in the offshore gillnet, shark longline and tuna longline fisheries (about 2,500 boats) in the deepwater benthic fishery for shark and in the bottom-set gillnet fishery for skate. Catch in offshore fisheries peaked at 25,000 t in 2000 but declined to about 2000 t by 2006. The main species taken are silky, blue and oceanic whitetip shark. Sharks are also taken as bycatch in other bottom-set gillnet fisheries, the bottom-set longline fishery and the beach seine fishery. About 15 boats are exclusively engaged in drift longline fishing for sharks, supplying fins to the export trade. A deepwater shark fishery of 80 to 90 vessels using baited hooks from 5 m fiberglass boats targets little gulper shark and leafscale gulper shark for oil (FAO 2009). Legislation pertaining directly to sharks is very limited. However, Landings of Fish (Species of Shark and Skates) Regulations 2001 require that fins are attached to sharks at the time of landing and precludes the landing of fins that have been removed from these species.
NPOA	None. Sri Lanka has reportedly sought assistance from the FAO to develop an NPOA-Sharks and is involved in regional consultations with India, the Maldives and Bangladesh regarding the development of an RPOA-Sharks (FAO 2009).
RFMOs	IOTC
Implementation of RFMO shark measures	Sri Lanka provides catch and effort data on shark fisheries to IOTC annually (FAO 2009). The Sri Lankan artisanal fishing fleet has been identified by IOTC as a major fleet for which historical catch and effort information on sharks is required (IOTC WPEB 2009; Herrera and Pierre 2010). Sri Lanka's requirement that sharks be landed with fins attached exceeds the 5% fin-to-carcass ratio requirement of the IOTC.
Participation in conventions	CITES, CMS
Implementation of shark measures	Not a signatory to CMS Shark MoU

New Zealand	
Shark catch (% of reported global catch) and main species reported	16,200 t (2.2%) Reports catch in 34 categories, of which 26 are species-specific. Twenty-two percent of the catch is spiny dogfish; 17% school (tope) shark, 11% dark ghost shark, 7% ghost shark (elephant fish), 7% New Zealand rough skate and 8% spotted estuary smoothhound.
Shark trade	New Zealand has reported exports to FAO in 10 categories since 2000, predominantly as frozen dogfish; frozen shark fillets; frozen fillets of shark, ray and chimaeras; and frozen shark. Exports of shark products averaged 3,600 t/year from 2000 to 2007. New Zealand has 25 trade codes for shark, with dark ghost shark, school shark, spotted dogfish, spiny dogfish and elephant fish products identified separately. There are no codes for shark fins. Official New Zealand export data indicate that exports of shark products averaged 3,000 t over the 2005-09 period and that the main export markets were South Korea (30%), Australia (28%), Japan (7%), France (6%) and China (5%) (Statistics New Zealand 2010). Hong Kong import data indicate that 80 t of shark fins were imported from New Zealand in 2008 (Oceana 2010).
Shark fisheries and management	Spotted dogfish, school shark and elephant fish are targeted, and a range of other shark species are taken as bycatch. Eleven shark species, accounting for about 85% of the weight of shark catch, are managed under the quota management system (QMS). It is illegal to discard QMS species except for blue shark, shortfin mako, porbeagle and smooth skate, which may be released if they are alive and likely to survive release, and spiny dogfish, which may be released dead or alive. TACs for eight of the 11 QMS shark species are set at a level that can produce MSY, and TACs for blue shark, shortfin mako and porbeagle are set without regard to MSY. The remaining shark species are managed as either open access or limited access fisheries. Live finning is illegal, but finning remains legal in national waters (Ministry of Fisheries, New Zealand 2008).
NPOA	NPOA adopted in 2008.
RFMOs	CCAMLR, CCSBT, WCPFC, NEAFC (CNP), SPRFMO
Implementation of RFMO shark measures	Release of live QMS pelagic shark species provides for the release of juvenile shark as encouraged by WCPFC measure 2009-04. New Zealand allows finning in domestic waters, but provisions in high seas permits cover finning outside the New Zealand EEZ (CCSBT 2010).
Participation in conventions	CITES, CMS
Implementation of shark measures	Not a signatory to CMS Shark MoU Basking shark and whale shark listed on Schedule 4 of the Fisheries Act: moratorium on issue of permits for these species, and existing permit holders can take them only as bycatch. Under the Wildlife Act, it is illegal to hunt, kill or harm a great white shark within New Zealand waters or to possess or trade in any part of the great white shark. Sanctions apply. Under the Fisheries Act, New Zealand-flagged vessels operating on the high seas are prohibited from taking great white sharks.

APPENDIX 1 - PROFILES

Portugal	
Shark catch (% of reported global catch) and main species reported	16,000 t (1.9%) Reports catch to FAO for 49 categories, including 36 species. Blue shark makes up 46%, "raja rays nei" 16%, shortfin mako 7%, leafscale gulper shark 7% and Portuguese dogfish 5%.
Shark trade	Reports exports to FAO of about 1,800 t of shark products annually and in nine categories, of which two-thirds are "sharks nei frozen" and nearly one-third are frozen shark fillets. Imports of shark products are negligible. Portugal's trade in shark product is predominantly intra-EU.
Shark fisheries and management	<p>The Portuguese longline fleet targets sharks in high seas fisheries (Shark Alliance 2010). Portugal's shark fisheries undertaken on the high seas by its pelagic fleets in the Atlantic and Indian oceans are not adequately documented; their longline catches of oceanic sharks are as large as or larger than the catch of tuna and swordfish; and most longliners now also target sharks (EC 2010).</p> <p>EU TACs are in force for porbeagle, spiny dogfish, and skates and rays. The TACs for porbeagle and spiny dogfish were set at zero in 2010. Council Regulation (EU) No. 23/2010 prohibits EU vessels from retaining on board, transshipping or landing basking shark and great white shark in all EU and non-EU waters, angel shark in all EU waters, common skate, undulate ray and white skate in specific zones, and porbeagle in international waters.</p> <p>EU Regulation (EC) No. 1185/2003 prohibits shark finning but provides for the issue of special permits to allow the removal of fins at sea so that fins and carcasses can be landed separately at different ports, on the condition that the weight of shark fins on board does not exceed 5% of the whole weight of the shark. Portugal issues an average of 17 special permits per year (EC 2010b). The EU is consulting on options to amend the regulation. Options include requiring that all sharks be landed with fins naturally attached.</p>
NPOA	The EU adopted a CAP for sharks in 2009.
RFMOs	ICCAT, IOTC, NAFO, NEAFC, SEAFO, SPRFMO, CCSBT (CNP). Also a member of WCPFC, CCAMLR and IATTC through EU membership but not active in these fisheries.
Implementation of RFMO shark measures	The fin-to-carcass provision of the special permits issues under EU Regulation (EC) No. 1185/2003, under which some Portuguese vessels operate, may not be in compliance with the intent of the fin-to-carcass ratio implemented by the WCPFC, IATTC, IOTC, ICCAT, GFCM, SEAFO, NEAFC and NAFO, because the ratio applied by these RFMOs relates to the weight of the shark on board (i.e., usually dressed weight rather than whole weight). However, the interpretation of the ratio is not specified in any of the RFMO measures, and ICCAT has agreed to allow members to interpret the ratio as best suits the operations of their vessels.
Participation in conventions	CITES, CMS
Implementation of shark measures	Not a signatory to CMS Shark MoU

Nigeria	
Shark catch (% of reported global catch) and main species reported	14,000 t (1.7%) Reports catch to FAO in two categories. "Rays, stingrays, mantas, nei" make up 44% and "sharks, rays, skates, nei" 56%.
Shark trade	Exports reported to FAO only for dried, unsalted fins, but the level of exports is negligible, as is the level of imports. Nigeria does not appear in the shark import data for the United States, Japan, Taiwan or the EU. Hong Kong import data identify 1.3 t of dried or frozen shark fin imports from Nigeria in 2008 (Oceana 2010).
Shark fisheries and management	No information could be obtained on the nature of shark fisheries and their management in Nigeria.
NPOA	No information available
RFMOs	ICCAT (since 2007)
Implementation of RFMO shark measures	Nigeria has failed to report Task I (nominal catch) or Task II (catch and effort) data (ICCAT 2010) and has not submitted annual reports since joining the commission. It is unclear whether Nigeria enforces the 5% fin-to-carcass ratio required under ICCAT.
Participation in conventions	CITES, CMS
Implementation of shark measures	Not a signatory to CMS Shark MoU

Iran	
Shark catch (% of reported global catch) and main species reported	14,000 t (1.7%) Reports catch in four categories, of which two are species-specific. Spottail shark makes up 80%.
Shark trade	Iran reported negligible exports of shark products to FAO as dried, unsalted fins from 2000 to 2007. It did not report any imports to FAO during that period. Shark fillets are sold domestically; dried and salted meat is exported to Pakistan; other meat is used in fish meal factories; and dried fins are transported mainly to UAE directly without any control and can be considered an illegal trade (FAO 2009). The UAE's data reported to FAO do not include imports of dried fins; however, about 450 t of dried fins are exported from the UAE each year (FAO Fisheries Department 2009).
Shark fisheries and management	Sharks are taken predominantly by bottom and drift gillnets and as bycatch by bottom trawl. The main species taken are whitecheek, spottail and milk sharks. Iran imposes a six-month closed season for sharks from March to August; has banned bottom trawlers in the Persian Gulf since 1993; has restricted bottom trawling in the Gulf of Oman to 4½ months per year; restricts gillnet mesh size; has reduced the number of trawlers from 69 to 38; and collects monthly catch and effort statistics (FAO 2009).
NPOA RFMOs	No information available on development of an NPOA. IOTC
Implementation of RFMO shark measures	Iran's artisanal fisheries are considered to be one of the major fleets involved in taking sharks in the IOTC area (IOTC WPEB 2009). There is no indication that Iran requires its vessels to comply with the IOTC fin-to-carcass ratio.
Participation in conventions	CITES, CMS
Implementation of shark measures	Not a signatory to CMS Shark MoU.

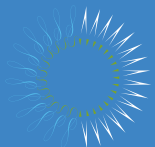
United Kingdom	
Shark catch (% of reported global catch) and main species reported	13,000 t (1.6%) Reports catch to FAO in 52 categories, including 39 species. Thirty-six percent of catch reported as "raja rays nei," 30% as picked dogfish, 7% as Portuguese dogfish and 5% as "dogfishes and hounds nei."
Shark trade	Reports exports to FAO in nine categories but predominantly as fresh/chilled skates and fresh/chilled sharks. No shark fin categories are identified. Exports of shark products averaged 4,000 t from 2000 to 2007, but these declined to an average of 2,200 t since 2005. Imports about 2,000 t of shark annually, composed mainly of fresh/chilled and frozen dogfish (Squalidae) and shark fillets. Imports are sourced from other EU member countries, the United States, Canada and New Zealand. U.K. exports of shark products go mainly to other EU member countries.
Shark fisheries and management	In U.K. coastal waters, EU waters and international waters, sharks are taken in directed commercial, incidental commercial, directed recreational and incidental recreational fisheries. In virtually every fishery (e.g., gillnet, longline, trawl, purse seine, pot, handgear) there are varying levels of directed or incidental catch of shark species. Incidentally caught species may be either retained or discarded, depending on their market value (Fowler et al. 2004). In 2007, shark catch landings of U.K. vessels outside EU waters (mostly of blue and mako sharks) totaled about 2,260 t, including 76 t of fins (CITES Animals Committee 2009). The U.K. has ceased issuing special fishing permits to allow finning under the derogation permitted by EU Regulation (EC) No. 1185/2003 and requires fins to be landed naturally attached to the carcass (EC 2010). EU TACs are in force for porbeagle, spiny dogfish, and skates and rays. The TACs for porbeagle and spiny dogfish were set at zero in 2010. Council Regulation (EU) No. 23/2010 prohibits EU vessels from retaining on board, transshipping or landing basking shark and great white shark in all EU and non-EU waters, angel shark in all EU waters, common skate, undulate ray and white skate in specific zones, and porbeagle in international waters. In November 2010, the U.K.'s MPA around the Chagos Archipelago took effect. This is the largest no-take MPA in the world and is expected to provide protection to a wide variety of shark and ray species (Zoological Society of London 2010).
NPOA RFMOs	NPOA adopted in 2004 (for U.K. waters) and CAP adopted in 2009. CCAMLR, IATTC, ICCAT, IOTC, NEAFC Also a member of NAFO, CCSBT (CNP), SEAFO and WCPFC through EU membership but not active in these fisheries.
Implementation of RFMO shark measures	The U.K. requirement for fins to be landed naturally attached exceeds the finning requirements of RFMOs. In response to IOTC recommendations and resolutions, the U.K. has introduced changes to the BIOT systems: Sharks and rays have been separated in longline logbooks; the removal of fins from sharks caught in BIOT was prohibited in 2006, and any sharks caught must be retained whole or released; targeted shark fishing is not permitted; and wire trace is banned to minimize shark bycatch. All sharks found on board during an inspection must be accounted for in logbooks; a new processing method has been adopted whereby the fins are partially cut through but left attached and folded over (IOTC Scientific Committee 2009).
Participation in conventions	CITES, CMS
Implementation of shark measures	Not a signatory to CMS Shark MoU The EC Wildlife Trade Regulation, which implements CITES in the EU, includes in its annexes the shark species listed in the CITES Appendices (CITES Animals Committee 2008). The Wildlife and Country Side Act (1981) applying to waters within 12 nm offshore makes it an offense to intentionally kill, injure, take, possess or trade basking shark. A species plan for basking shark has been developed including actions, targets and reporting on targets on a three- to five-year cycle (Barriera 2008).

APPENDIX 1 - PROFILES

South Korea	
Shark catch (% of reported global catch) and main species reported	12,000 t (1.4%) Reports catch to FAO in seven categories, of which five are species-specific. Eighty-seven percent reported as "rays, stingrays, mantas, nei."
Shark trade	Reports exports to FAO in six categories, although exports are limited (about 350 t/year of "sharks nei, frozen" and about 13 t of shark fins). South Korea is a significant importer of shark products, with imports averaging 22,000 t/year in the 2000-07 period. Imports consist mainly of frozen sharks, rays and chimaeras and some fresh chilled shark product. South Korea's official trade data are reported in these categories: shark fin, dogfish and other sharks, frozen; dogfish and other sharks fresh and chilled; frozen skates; frozen rays; and frozen shark liver oils and its factions. Exports have risen significantly since 2007, with exports of shark fins from 2007 to 2009 averaging 57 t (compared with 13 t 2000-07) and exports of frozen shark products averaging 885 t (compared with 199 t). Most fin exports go to Hong Kong, and most frozen product goes to New Zealand, Uruguay and Spain. South Korea is a significant importer of skates and rays, with imports of these products averaging 10,000 and 9,000 t/year respectively from 2005 to 2009. Major suppliers of skates are Argentina, Chile, the United States, Uruguay and Canada, and major suppliers of rays are Argentina, Brazil, the United States, Vietnam, Uruguay and Thailand. Imports of frozen dogfish and other sharks over the same period averaged 2,800 t/year with most product sourced from Taiwan, Japan, China and Singapore (KITA 2010).
Shark fisheries and management	It has not been possible to obtain information about the nature and extent of shark fisheries and their management in South Korea. Korean observers report silky shark and whale shark taken in purse seine fisheries in the WCPO and blue, silky, bigeye thresher, longfin mako and oceanic whitetip shark taken in longline fisheries in the WCPO (WCPFC Scientific Committee 2010).
NPOA	Reported to be in development in 2007.
RFMOs	CCAMLR, CCSBT, IATTC, ICCAT, IOTC, NAFO, WCPFC
Implementation of RFMO shark measures	South Korea has implemented recommendations and resolutions adopted by regional fisheries organizations, including legislation to regulate RFMO requirements, initiation of an observer program and submission of fisheries statistics. Although South Korea has introduced additional columns for sharks into WCPFC logbooks in 2009 (WCPFC Scientific Committee 2010), it opposed the adoption of an extended list of shark species to be reported in IOTC logbooks (IOTC Scientific Committee 2009). South Korea applies the 5% fin-to-carcass ratio required by IOTC and WCPFC (CCSBT 2010).
Participation in conventions	CITES, not CMS
Implementation of shark measures	In CITES, South Korea has taken out a reservation on the Appendix II listing of basking shark and whale shark. Not a signatory to CMS Shark MoU

APPENDIX 2

Common and scientific names			
Common Name	Scientific Name	Common Name	Scientific Name
Angel Shark	<i>Squatina squatina</i>	New Zealand Rough Skate	<i>Dipturus nasuta</i>
Argentine Angel Shark	<i>Squatina argentina</i>	Oceanic Whitetip Shark	<i>Carcharhinus longimanus</i>
Atlantic Sharpnose	<i>Rhizoprionodon terraenovae</i>	Pelagic Thresher	<i>Alopias pelagicus</i>
Basking Shark	<i>Cetorhinus maximus</i>	Pigeye Shark	<i>Carcharhinus amboinensis</i>
Bigeye Thresher	<i>Alopias superciliosus</i>	Pondicherry Shark	<i>Carcharhinus hemiodon</i>
Big Skate	<i>Raja binoculata</i>	Porbeagle	<i>Lamna nasus</i>
Blacknose Shark	<i>Carcharhinus acronotus</i>	Porcupine Ray	<i>Urogymus asperrimus</i>
Blacktip Reef Shark	<i>Carcharhinus melanopterus</i>	Portuguese Dogfish	<i>Centroscymnus coelolepis</i>
Blacktip Shark	<i>Carcharhinus limbatus</i>	Requiem sharks	Family Carcharhinidae
Blue Shark	<i>Prionace glauca</i>	Salmon Shark	<i>Lamna ditropis</i>
Brownbanded Bamboo Shark	<i>Chiloscyllium punctatum</i>	Sandbar Shark	<i>Carcharhinus plumbeus</i>
Bull Shark	<i>Carcharhinus leucas</i>	Scalloped Hammerhead	<i>Sphyrna lewini</i>
Caribbean Reef Shark	<i>Carcharhinus perezi</i>	School Shark (Tope Shark)	<i>Galeorhinus galeus</i>
Common Skate	<i>Dipturus batis</i>	Shortfin Mako	<i>Isurus oxyrinchus</i>
Copper Shark	<i>Carcharhinus brachyurus</i>	Silky Shark	<i>Carcharhinus falciformis</i>
Cowtail Stingray	<i>Pastinachus sephen</i>	Slender Bamboo Shark	<i>Chiloscyllium indicum</i>
Cuckoo Ray	<i>Raja naevus</i>	Small Spotted Catshark	<i>Scyliorhinus canicula</i>
Dark Ghost Shark	<i>Hydrolagus novaezealandiae</i>	Smooth Hammerhead	<i>Sphyrna zygaena</i>
Elephant Fish (Ghost Shark)	<i>Callorhynchus milii</i>	Spadenose Shark	<i>Scoliodon laticaudus</i>
Finetooth Shark	<i>Carcharhinus isodon</i>	Speartooth Shark	<i>Glyphis glyphis</i>
Freshwater Sawfish	<i>Pristis microdon</i>	Spiny Dogfish (Picked Dogfish)	<i>Squalus acanthias</i>
Ganges Shark	<i>Glyphis gangeticus</i>	Spottail Shark	<i>Carcharhinus sorra</i>
Ganges Stingray	<i>Himantura fluviatilis</i>	Spotted Estuary Smoothhound (Rig/Spotted Dogfish)	<i>Mustelus lenticulatus</i>
Great White Shark	<i>Carcharodon carcharias</i>	Thorny Skate	<i>Ambyraja radiata</i>
Green Sawfish	<i>Pristis zijsron</i>	Thresher Shark	<i>Alopias vulpinus</i>
Grey Bamboo Shark	<i>Chiloscyllium griseum</i>	Thresher sharks	Genus <i>Alopias</i>
Gulper Shark	<i>Centrophorus granulosus</i>	Tiger Sand Shark	<i>Carcharias taurus</i>
Hammerhead sharks	Genus <i>Sphyrna</i>	Tiger Shark	<i>Galeocerdo cuvier</i>
Hardnose Shark	<i>Carcharhinus macloti</i>	Undulate Ray	<i>Raja undulata</i>
Leafscale Gulper Shark	<i>Centrophorus squamosus</i>	Whale Shark	<i>Rhincodon typus</i>
Little Gulper Shark (Southern Dogfish)	<i>Centrophorus uyato</i>	Whiptail stingrays	Family Dasyatidae
Longfin Mako	<i>Isurus paucus</i>	White Skate	<i>Rostroraja alba</i>
Longtailed carpet sharks	Family Hemiscyllidae	Whitecheek Shark	<i>Carcharhinus dussumieri</i>
Mako sharks	Genus <i>Isurus</i>	Whitespotted Bamboo Shark	<i>Chiloscyllium plagiosum</i>
Milk Shark	<i>Rhizoprionodon acutus</i>	Whitespotted Wedgefish (Whitespotted Guitarfish)	<i>Rhynchobatus djiddensis</i>
Narrow Sawfish	<i>Anoxypristis cuspidata</i>	Whitespotted Whipray	<i>Himantura gerrardi</i>
Narrownose Smoothhound	<i>Mustelus schmitti</i>	Winghead sharks	Genus <i>Eusphyra</i>



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