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A COUNTRY AND REGIONAL PRIORITISATION FOR SUPPORTING IMPLEMENTATION OF CITES PROVISIONS FOR SHARKS

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A COUNTRY AND REGIONAL PRIORITISATION FOR SUPPORTING IMPLEMENTATION OF CITES PROVISIONS FOR SHARKS

Marcelo Vasconcellos
Fishery Resources Officer
FAO Fisheries Department
Rome, Italy

Monica Barone
Consultant
FAO Fisheries Department
Rome, Italy

and

Kim Friedman
Senior Fishery Resources Officer
FAO Fisheries Department
Rome, Italy

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PREPARATION OF THIS DOCUMENT

The CITES–FAO MoU signed in 2006 sets out that the organizations will cooperate to facilitate capacity building in developing countries and countries with economies in transition on issues relating to commercially exploited aquatic species listed on the CITES Appendices. The aim of this document is to develop new criteria to identify countries potentially in need of capacity building support, and set priorities based on where such measures can have the greatest positive influence on the sustainable use of shark and ray resources. The collation of data on shark fisheries and trade from a global subset of developing countries was the foundation of the prioritization process: this provided details on the current legal framework for fisheries and the management tools in place, encouraging consideration of their effectiveness for conservation and the sustainable use of listed shark and ray species. Financial support for this document was provided by the European Union as part of the "Cooperation between FAO and CITES supporting shark and ray fishery management (EP/INT/227/UEP)" project.

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ABSTRACT

New shark and ray species were added to Appendix II of CITES in 2016 (COP17 in Johannesburg, South Africa) that will enter into effect in 2017. In order to prioritise where support for FAO Member States can be targeted to assist in the implementation of CITES provisions for management of sharks and rays, FAO reviewed current fishery related information that highlights a range of fishery information by country and region. Detailed reports on the situation of shark and ray fisheries are collated for each country, including summary information on fisheries and trade in sharks and rays, assessment of capacity to implement CITES requirements, governance and institutional arrangements. The results of the prioritization process and assessment of capacity needs can help guide the future delivery of investment in relation to management and conservation of sharks, in general, and specifically to support implementation of CITES provisions by countries involved in the fisheries and trade in listed species of sharks and rays.

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ABBREVIATIONS AND ACRONYMS

ACIAR	Australian Centre for International Agricultural Research
APFIC	Asia-Pacific Fishery Commission
ATLAFCO	Ministerial Conference on Fisheries Cooperation among African States Bordering the Atlantic
BCLME	Benguela Current Large Marine Ecosystem
BOBLME	Bay of Bengal Large Marine Ecosystem
BOBP-IGO	Bay of Bengal Programme Inter-Governmental Organisation
BRD	by-catch reduction device
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
CCLME	Canary Current Large Marine Ecosystem
CECAF	Fishery Committee for the Eastern Central Atlantic
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMFRI	Central Marine Fisheries Research Institute
CMS	Convention on the Conservation of Migratory Species of Wild Animals
COFI	FAO Committee on Fisheries
COMHAFAT-CONABIO	National Commission for the Knowledge and Use of Biodiversity
CONAPESCA	Comisión Nacional de Acuacultura y Pesca (National Comission of Aquaculture and Fishing of Mexico)
COPESCAALC	Oficina Regional de la FAO para América Latina y el Caribe (Commission for Fisheries and Aquaculture for Latin America and the Caribbean)
COREP	Regional Commission of Fisheries of Gulf of Guinea
CPREEC	Environmental Education Centre of the Ministry of Environment and Forests, Government of India
CPUE	catch per unit of effort
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CSO	civil society organizations
CTMFM	Comisión Técnica Mixta del Frente Marítimo (Joint Technical Commission of the Maritime Front)
DFAR	Department of Fisheries and Aquatic Resources
DWLC	Department of Wildlife Conservation
EC	European Commission
EEZ	exclusive economic zone
FAOLEX	FAOLEX Legal Database
FCWC	Fishery Committee for the West Central Gulf of Guinea
FFPO	Fauna and Flora Protection Ordinance
GFCM	General Fisheries Commission for the Mediterranean
IATTC	Inter-American Tropical Tuna Commission
IBAMA	Brazilian Institute of the Environment and Renewable Natural Resources
ICCAT	International Commission for the Conservation of Atlantic Tunas
ICES	International Council for the Exploration of the Sea
ICMBIO	Intituto Chico Mendes de Conservacao da Biodiversidade
IFAW	International Fund for Animal Welfare
IFO	Iran Fisheries Organization
IFS	Introduction from the Sea (provisions of CITES)
IGO	International Governmental Organization
INCOPESCA	Instituto Costarricense de Pesca y Acuicultura
INIDEP	Instituto Nacional de Investigaciones Pesqueras
INSOPESCA	Socialist Institute of Fisheries and Aquaculture
IOTC	Indian Ocean Tuna Commission
IPOA-Sharks	International Plan of Action for Conservation and Management of Sharks
ISSCAAP	Standard Statistical Classification of Aquatic Animals and Plants

IUCN	International Union for Conservation of Nature and Natural Resources
IUU	illegal, unreported and unregulated fishing
LDC	least developed countries
LIFDC	FAO low-income food-deficit countries
MCS	Monitoring, control and surveillance
MPEDA	Marine Products Export Development Authority
NAFO	Northwest Atlantic Fisheries Organization
NARA	National Aquatic Resources Research and Development Agency
NDF	Non-detriment findings
NEAFC	North East Atlantic Fisheries Commission
NEPAD	New Partnership for Africa's Development
NESREA	National Environmental Standards and Regulations Enforcement Agency
NFRDI	National Fisheries Research and Development Institute
NGO	non-governmental organization
NIBR	National Institute of Biological Resources
NPOA-IUU	International Plan of Action to Prevent, Deter, and Eliminate Illegal, Unreported and Unregulated Fishing
NPOA-Sharks	National Plan of Action for Conservation and Management of Sharks
OFRO	Iranian Fisheries Research Organization
OLDEPESCA	Organización Latinoamericana De Desarrollo Pesquero
OSPESCA	Central America Fisheries and Aquaculture Organization
PAF	Partnership for African Fisheries
PERSGA	Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden
PNBA	Banc d'Arguin National Park
RAA	The Aquaculture Network for the Americas
RECOFI	Regional Commission for Fisheries
RFB	Regional Fisheries Bodies
RFMO	regional fisheries management organization
RST	Review of Significant Trade
SADC	Southern African Development Community
SCMFMCSGG	Sub-Regional Cooperation in Marine Fisheries Monitoring, Control and. Surveillance in the Southern Gulf of Guinea
SCRS	Standing Committee on Research and Statistics
SEAFDEC	Southeast Asian Fisheries Development Center
SEAFO	Southeast Atlantic Fisheries Organization
SIDS	UN Small Island Developing States
SIF	Stop Illegal Fishing
SRFC	Sub-Regional Fisheries Commission
SSME	Sulu-Sulawesi Marine Eco-region
SWIOFC	Southwest Indian Ocean Fisheries Commission
TAC	total allowable catch
TED	Turtle Excluder Device
VMS	Vessel Monitoring Systems
WCPFC	Western and Central Pacific Fisheries Commission
WECAFC	Western Central Atlantic Fishery Commission

SUMMARY

Following the shark and ray amendments to the CITES Appendix II in 2013 at CITES COP 16; implemented in 2014, an assessment of the countries affected by these listing amendments was conducted (Fisher and Barone, 2013), and a wide range of governance and capacity needs identified for the implementation of CITES listings across 35 developing countries (FAO, 2016a, 2016b). As a result, the overall understanding of the further capacity needs required has improved and guided the implementation of a number of capacity building activities as a consequence.

In this report we apply revised criteria to identify those candidate countries affected by the CITES listings of marine elasmobranchs in order to prioritize those potentially in need of management support; if assisted, these countries could have the greatest positive influence on the sustainable use of shark and ray resources. We then evaluate the capacity in a global subset of priority countries to implement the CITES provisions for the trade in listed shark and rays species, updating the information used in the earlier capacity needs assessment (FAO, 2016a, 2016b). The evaluation summarizes data on shark fisheries and trade, providing details on the current legal framework for fisheries and the management tools in place, with due consideration of their effectiveness for the conservation and sustainable use of listed shark and ray species.

A total of 50 countries in Africa, Asia, Latin America and Oceania were identified using the revised criteria (compared to 35 countries in Fischer and Barone, 2013). Most priority countries were identified in Asia followed closely by Africa. The selection of countries was largely driven by the impact of their fisheries on shark and ray resources, although in some cases, countries important in the trade of shark commodities also influenced the selection. As the availability of reported information is skewed towards particular countries and regions, the prioritization exercise also takes into account other factors, such as regional balance, and other pragmatic factors based on expert opinion, that potentially elevate or diminish a potential country's need or suitability for support.

The assessment of the capacity needs in a subset of 29 priority countries in Asia, Africa and Latin America revealed that very few countries meet all the minimum conditions to implement the CITES requirements to export Appendix II species of sharks and rays. Overall, the capacity was poorer in African countries. Several of the countries analysed already have a management framework in place that could support the regulation of shark fisheries and provide the basis for meeting the CITES requirements. However, implementation is normally hampered by the limited information available to support the making of non-detriment findings (NDFs), which is compounded by limitations in the ability to identify the listed species in the catch and trade, and the weak enforcement capacity in fisheries.

The results of this study should help in informing the discussion of where assistance in the delivery of capacity support for the conservation and sustainable use of shark and ray resources is most needed and likely to have the biggest positive effect on management. The authors recognize that beyond the criteria developed in this study other factors need to be taken into account as well; for example, direct requests for assistance from countries should also be considered as a priority, as even small gains implemented with willing partners can offer long-term benefit in the management and conservation of shark and ray resources.

INTRODUCTION

Shark[1] species were first listed in the Appendices of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in 2003. There are currently 26 species of sharks listed as well as four additional species (silky sharks and the three thresher sharks), which will enter into force on 4 October 2017. Appendix I lists seven species of sawfish (CoP14, 2007); the other 23 species are listed under CITES Appendix II and they are: three shark species not commonly commercially exploited (basking shark, great white shark and whale shark) that were listed between 2003–2005; seven species (whitetip shark, porbeagle, hammerhead sharks, the two manta rays) added in 2013 at the 16th Meeting of the CITES Conference of the Parties (CoP16); four sharks (silky shark, three thresher sharks) and all the species of the genus Mobula added at the CoP17 in 2016 (CITES, 2016).

In 2013 FAO and CITES developed a strategy for assistance to fishery nations catching and/or exporting sharks and shark products that were expected to be affected by the listings of sharks. A total of 35 priority countries affected by the CITES listings of marine elasmobranchs were selected by Fisher and Barone (2013), based on the importance of shark catches and trade, the likely occurrence of the listed species in their waters and their level of socio-economic development. To assess the capacity and needs of these fishing nations to comply with the new CITES listings, regional assessments covering selected priority regions (developing countries) in Africa, Asia and Latin America were carried out with input from FAO and CITES. Since 2014, the two organizations have developed and implemented a collaborative project funded by the European Union: "Strengthening capacity in developing countries for sustainable wildlife management and enhanced implementation of CITES wildlife trade regulations, with particular focus on commercially exploited aquatic species".

As part of the regional assessments, two regional workshops were organized by FAO and CITES in 2014: the African Regional Consultative Workshop on Capacity Assessments for the Implementation of New CITES Listings of Sharks and Manta Rays was held in Casablanca, Morocco, from 11 to 13 February 2014; the Asian Regional Consultative Workshop on Capacity Assessments for the Implementation of New CITES Listings of Sharks and Manta Rays was held in Xiamen, China, from 13 to 15 May 2014. These workshops identified the main areas for capacity development in the regions and set out road maps for the implementation of CITES requirements in relation to recently listed sharks and manta rays. No similar workshop was organized for Latin America, as the needs of the region had previously been addressed by the Regional Workshop on Sharks Listed in Appendix II of CITES – Preparing for Implementation (2–4 December 2013, Recife, Brazil), organized by the governments of Brazil and the United States of America with the support of CITES and other organizations.

Before the aforementioned workshops, a questionnaire was sent to the nominated focal points at the national CITES and fisheries authorities of the 35 priority countries. The questionnaire was designed to obtain information on: the characteristics of the fisheries catching the listed species; the uses and trade of commodities derived from these species; the overall situation of shark fisheries management in the countries; and the main limitations to implementing the Appendix II listings of sharks and manta rays. The information collected was analysed by the CITES Secretariat, with the data then revised in consultation with shark specialists and the focal points of the relevant countries. Finally, a summary of the results was exhibited in the form of a poster during several meetings, including: the "Bay of Bengal Capacity Building Workshop on CITES Appendix II Listings of Shark and Manta Ray Species" Chennai, India, in 2014 (CPREEC, 2014); the 28th Meeting of the Animals Committee, Tel Aviv, Israel, 2015; and finally at the CoP17, Johannesburg, 2016.After considering a new suite of shark species listed at CoP17 in Johannesburg in 2016, and in view of an expected new phase of investment for assisting countries with the implementation of CITES provisions for the management of sharks and rays, FAO reassessed country and regional prioritization, based on updated fishery and trade information.

[1] The term "shark" is used in the broad sense of the FAO International Plan of Action for the Conservation and Management of Sharks and includes all species of sharks, skates, rays, and chimaeras (Class Chondrichthyes).

First, FAO conducted a revision of the criteria for the selection of the priority areas with input from the staff of RFMOs and CITES. This revision of criteria benefited from the original thinking of Fisher and Barone (2013), but also included additional criteria in the region and country prioritization process to incorporate a range of new considerations, as explained in the methods. This document presents a new prioritization together with an updated assessment of the capacity to implement the CITES provisions for the listed species of sharks in a subset of the priority countries.

The current assessment of capacity needs to implement CITES requirements is conducted on a subset of the priority countries, updating the information on fisheries, trade and management measures obtained in collaboration with the country's focal points for the assessment carried out in 2014 (FAO, 2014a, 2014b). This subset comprises 7 countries in Africa, 13 in Asia and 9 countries in Latin America. Detailed reports on the situation for shark and ray fisheries in each of the 29 countries of the subset are collated, including summary information on fisheries and trade in sharks and rays, as well as an assessment of capacity needs to implement CITES requirements, governance and institutional arrangements. Information from these situation reports assisted in providing the foundation of the prioritization process, together with data on capture production and trade.

The results of the prioritization are presented in **Part One** of the document, which reveals a new list of priority regions and countries to help guide the future delivery of investment in relation to supporting the implementation of CITES provisions for the management of sharks and rays. Results of the capacity analysis of selected countries in the priority list to fulfil CITES requirements for the listed species of sharks are summarized in **Part Two** of the document. Detailed reports on the situation for shark and ray fisheries for the subset of 29 countries are included in Annex 2.

METHODS

This study consists of two parts, **Part One,** presenting the criteria to identify candidate countries impacted by the CITES listings of marine elasmobranchs; and **Part Two,** dealing with the assessment of the capacity of a global subset of priority countries to implement CITES provisions for the international trade in listed shark species.

PART ONE

Criteria for the selection of priority regions and countries

A preliminary list of relevant countries for fisheries and trade of sharks and shark products was obtained from the FAO FishStatJ datasets on Global Capture Production (1950–2015) (FAO, 2017a) and Global commodities production and trade (1950–2013) (FAO, 2016c), filtering for countries reporting data from the ISSCAAP group "sharks, rays, chimaeras". This preliminary list of countries was then filtered by applying four criteria (Table 1).

The first criterion used in the definition of priority countries was the reported level of shark fisheries production. Following Fischer *et al.* (2012), and consistent with the IPOA-Sharks, attention was given to the top shark-fishing countries, defined as those reporting at least 1 percent of the global shark production during the decade from 2006–2015 period. Moreover, only 'developing' countries – e.g. FAO Low-Income Food-Deficit Countries (LIFDC), UN Least Developed Countries (LDCs), UN Small Island Developing States (SIDS) – were included, as these countries were considered to have the greatest need for support in developing their capacity to cope with the CITES provisions.

A second criterion was applied to select countries that are catching sharks regularly but do not yet have an adopted National Plan of Action for the sustainable use and conservation of shark resources (NPOA-Sharks). Countries reporting more than 1 000 tonnes of sharks per year that did not have an NPOA were included in this list.

The third criterion was based on trade considerations. Countries reporting an average export or import of shark products over 1000 tonnes during the decade 2004–2013 period were considered eligible becaue of the significance of the trade flow.

The fourth criterion followed a more pragmatic approach, making use of expert input from technical fisheries staff at FAO, Regional Fisheries Bodies (RFBs and Regional Fisheries Management Organisations, RFMOs) and the CITES Secretariat to assist in the prioritization across countries. For this criterion, special consideration was given to: a) country relevance for threatened species, b) data completeness, c) the governance interventions that were being put in place, d) the spatial balance of future implementation support, and e) a country's openness to receiving assistance. To put this into action, expert knowledge of shark fisheries, capture production and trade records was used. With reference to these aspects specifically:

a) Countries where captures included threatened species of sharks and rays were identified and prioritized over those where CITES-listed species were less commonly caught.

b) To propose a qualifier on data completeness, experts recognized that the quality of capture production and trade records varied across countries, especially where weak capacity at the local level resulted in less comprehensive reporting of capture production and trade (e.g. shark included under aggregated commodity categories or potentially being under-reported in both catch and trade). Therefore, expert knowledge of shark catches as a target or bycatch species (e.g. in tuna fisheries), and a knowledge of the markets and trade of shark products (e.g. shark meat) was also called upon to modulate the significance of some countries, whereby the importance for prioritization may have been underestimated by using reported information alone.

c) We ensured that we did not prioritize a country in which recent legislation had been enacted that prevented landing, transhipment or retention of CITES-listed sharks and rays; in such cases governance support would largely be limited to enforcement support when dealing with CITES

provisions, rather than supporting government actions on governance, fishing effort, stock survey and assessment, and understanding markets.

d) To consider the special needs of Small Island Developing States (SIDS) given their major reliance on marine resources, and to ensure a geographical balance across and between continents, some modulation of the results was made to countries included in the priority lists.

e) Experts offered insights into countries' interest in receiving assistance on implementation of CITES listings provisions, through feedback from country representatives involved in RFMO's technical working groups, CITES discussions or talks with FAO. These were all taken into account, noting that the task of assisting countries should recognize the importance of having willing partners.

Table 1. Criteria for the selection of priority countries for assistance in relation to the implementation of CITES provisions for sharks.

CRITERION	EXPLANATION
1	Developing countries (FAO LIFDC, UN LCD, UN SIDS), reporting Capture Production of sharks more than 1 percent of the Global Capture Production of Sharks (ca. 7,000 tonnes per year).
2	Developing countries, not having adopted an NPOA-Shark, reporting Capture Production for sharks of more than 1,000 tonnes per year.
3	Developing countries, not having adopted an NPOA-Shark, reporting export or import of shark commodities of more than 1,000 tonnes per year.
4	Special considerations (see text in methods).

PART TWO

Assessment of the capacity of selected countries to fulfil CITES requirements for the listed shark species

Countries covered in the assessment

The current assessment has been conducted on a subset of the priority countries, updating the information on fisheries, trade and management measures obtained in collaboration with the country's focal points for the assessment carried out in 2014 (FAO, 2014a, 2014b). This subset comprises 7 countries in Africa, 13 in Asia and 9 countries in Latin America, for which a detailed country report is available in Annex 2. With regard to the new countries identified as potentially in need of capacity building support and selected in Part One (e.g. countries in Oceania and the Caribbean), an analogous assessment of their capacity to fulfil CITES requirements will still need to be completed, possibly as a component of future assistance for the conservation and management of sharks and rays in 2018–2019.

Sources of information

The country assessments are based on several sources of information:

- responses to a questionnaire sent to nominated country focal points from national CITES and fisheries authorities (and the subsequent correspondence), prior to the regional consultative workshops in Casablanca, Morocco, and Xiamen, China, in 2014 (Annex 1);additional information collected during the regional consultative workshops in Casablanca, Morocco and Xiamen, China, in 2014 (FAO, 2014a, 2014b); the results of the Regional Workshop on Sharks Listed in Appendix II of CITES – Preparing for Implementation (2–4 December 2013, Recife, Brazil), organized by the governments of Brazil and the United States of America;inputs received during CITES meetings, including the "Bay of Bengal Capacity Building Workshop on CITES Appendix II Listings of Shark and Manta Ray Species" in Chennai, India, in 2014 (CPREEC, 2014); the twenty-eighth meeting of the Animals Committee, Tel Aviv, Israel, 2015; and finally at the CoP17, Johannesburg, 2016.

- FAO database of measures on conservation and management of sharks (FAO, 2016b);
- FAOLEX database (FAO, 2016a);
- FAO work programme input, e.g. FAO South and Southeast Asian, CITES Impact workshop, Penang, February 2016); anda literature review (e.g. Dent and Clarke (2015), Finnegan et al. (2015), Lucifora et al. (2011);,Osch (2012) and Dulvy et al. (2017)].

Analytical framework

According to Article IV of the CITES Convention, the export of species listed in Appendix II requires an export permit issued by the CITES authorities of the exporting country. The export permit should only be granted when the following conditions are met

a) Scientific Authority of the State of export has advised that such export will not be detrimental to the survival of that species;
b) Management Authority of the State of export is satisfied that the specimen was not obtained in contravention of the laws of that State for the protection of fauna and flora; and
c) Management Authority of the State of export is satisfied that any living specimen will be so prepared and shipped as to minimize the risk of injury, damage to health or cruel treatment (Convention text Article IV, para.2).

Considering that trade in the listed species of sharks and rays mainly involves processed products such as meat, fins, skin, etc., conditions (a) and (b) are the ones most relevant to shark-exporting countries.

Article IV also stipulates that species caught beyond national jurisdictions can only be brought into a country (introduction from the sea) with a certificate from a, "Management Authority of the State of introduction". The certificate should only be granted when the following conditions are met :

a) Scientific Authority of the State of introduction advises that the introduction will not be detrimental to the survival of the species involved; and;
b) Management Authority of the State of introduction is satisfied that any living specimen will be so handled as to minimize the risk of injury, damage to health or cruel treatment. (Convention text Article IV, para.6).

For the same reasons as those expressed above, condition (a) is the one relevant to the states of introduction. In addition, Resolution Conf. 14.6 (Rev. CoP16) recommends that Parties take into account whether or not the specimen was or will be acquired and landed:

i) in a manner consistent with applicable measures under international law for the conservation and management of living marine resources, including those of any other treaty, convention or agreement with conservation and management measures for the marine species in question; and
ii) through any illegal, unreported or unregulated (IUU) fishing activity.

Therefore, the implementation of the new sharks and manta rays listings will require the capacity of Parties to comply with two basic requirements:

1) *Determine that trade will not be detrimental to the survival of the species (i.e. non-detriment findings or NDFs)*
2) *Ensure that trade is conducted in specimens that were legally acquired (i.e. legal acquisition findings).*

The approach and criteria used in the assessment of each requirement is detailed below.

1) Non-detriment findings

There is no single approach to be followed in the making of NDFs. Resolution Conf. 16.7 provides a list of non-binding concepts, guiding principles and methods that scientific authorities can take into account when considering whether trade would be detrimental to the survival of a species. Among the recommended

reference materials are the results of the International Expert Workshop on Non-detriment findings, organized by the CITES Authority of Mexico in Cancún, 17–22 November 2009 (AC24 Doc. 9.1).

The Workshop concluded that the following were essential to enable the NDF process for fish:

- the need to consider all sources of significant mortality which affect the species in trade;
- the need to consider whether establishing harvest/export quota is enough to achieve set conservation goals;[2]
- collaboration between scientific authorities and fisheries experts;
- transboundary migrants and shared stocks require regional NDF cooperation;
- when possible, base NDF on both fisheries-dependent and independent information/data (be cautious with fisheries-dependent data, verify when possible);
- need the techniques and legislation to distinguish between farmed, captive-bred and wild individuals;
- the management on which the NDF is based should employ principles of adaptive and participatory management (see Figure 1);
- the Parties are encouraged to report the methods with which NDFs are being made on an annual basis to the Secretariat so as to enable transparency; learning from other NDF processes is also vital, as well as ensuring that fish species which range beyond the boundaries of one state are accounted for by all range states in their individual NDF processes. This last point is in line with CoP decision 17.209.[3]

These conclusions have important implications for sharks, notably that an NDF can be made when there is a functional management system that addresses the known sources of shark mortality. A functional management system comprises a body of regulatory norms including: management measures, the means of ensuring compliance and assessing the effectiveness of the management measures. In the absence of such a system, Parties could base the NDF on a precautionary management system that implements management measures established using the best available knowledge and adaptable over time as more information becomes available. The measures would not necessarily have to be restricted to export quotas, and such precautionary systems could be established for any situation (including data-poor fisheries), as long as appropriate monitoring and enforcement mechanisms are in place to enable the evaluation of their effectiveness over time. In fisheries these mechanisms normally involve some type of stock assessment and fisheries monitoring, control and surveillance (MCS).

2 Resolution Conf. 14.7 (Rev. CoP15) makes clear in the guidelines in its Annex that quotas meet the requirements of making an NDF only when based on advice by the Scientific Authority on which level of trade has no detrimental effect (which is an NDF) (Daniel Kachelriess, pers. comm.).

3 See www.cites.org/eng/dec/valid17/81873

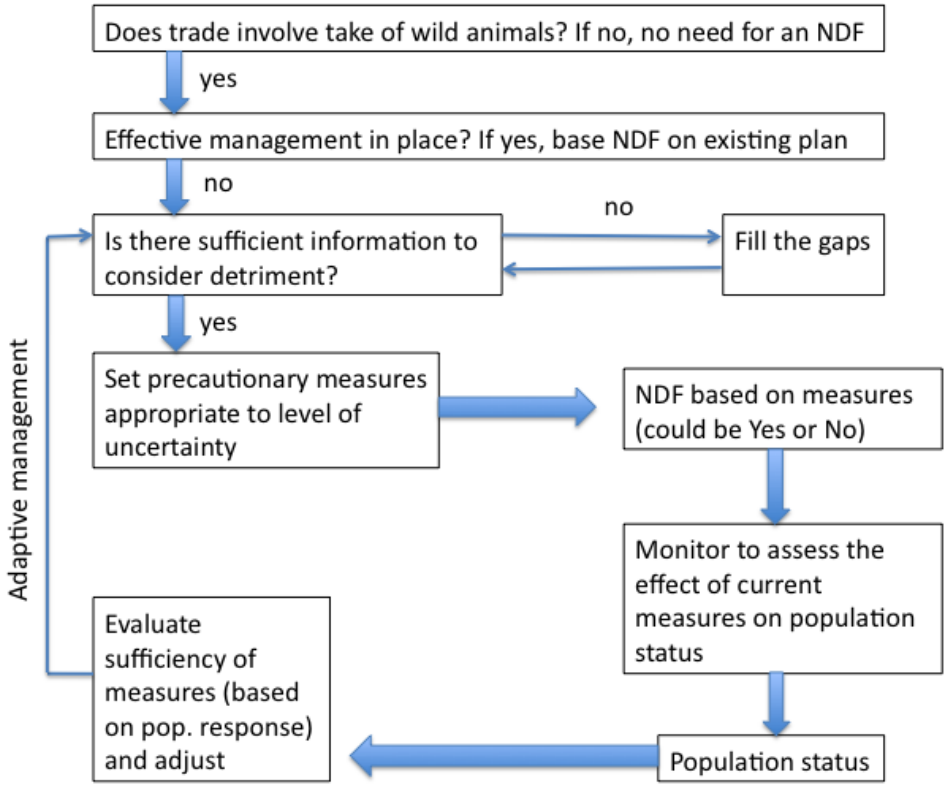

Figure 1. Flowchart describing the logical steps for making an NDF for fish species in trade (adapted from CITES AC24 Doc. 9.1 International expert workshop on non-detriment findings).

Similarly, CITES has a "safety net" process to identify situations where the export of Appendix II-listed species reaches detrimental levels: this is known as a Review of Significant Trade (RST). During RST, countries with significant levels of trade will be asked to provide the scientific basis by which they established that their exports are not detrimental to the survival of the species concerned and compliant with the relevant CITES provisions. If an exporting country cannot do so, the relevant CITES Scientific Committee (in the case of sharks, the Animals Committee) will make recommendations on which measures the exporting country needs to take in order to comply with CITES regulations within a strict timeframe; if a country fails to implement these recommendations it will be subject to compliance measures, which may include the suspension of trade.

In practical terms a scientific authority can make non-detriment findings for specimens that were legally acquired under the management system (i.e. a specimen which was harvested according to the established measures) until the monitoring system reveals a negative impact, at which point resource management would have to be adapted. The monitoring of the status of the resources over time would indicate the need to adopt more or less restrictive management measures. Thus, the second implication of the Workshop conclusions is that for the case of fisheries the two basic requirements for exporting an Appendix II species (non-detriment findings and legal acquisition findings) are in effect interdependent aspects of the same problem – the sustainable management of shark fisheries. Finally, one obvious implication of these conclusions is that in order for the system to work there must be close cooperation and collaboration between CITES and fisheries authorities, both nationally and regionally. The latter are particularly important for stocks shared among two or more states. Regional cooperation will typically involve the exchange of information about stocks and fisheries, and the harmonization of the management measures adopted by the countries sharing these resources.

In support of the above conclusions, FAO (2012) noted that:

> *[…] the effective implementation of trade regulation regimes will depend on the capability of exporting coastal states to properly implement appropriate fishery conservation/management measures as well as on the medium- to long-term socio-economic gain that can be achieved through a more sustainable use of the fishery resources.*

> *[…] while every effort to improve the scientific assessment of sharks should be made, the application of adaptive management and precautionary management approaches as well as the ecosystem approach to fisheries should be considered for the conservation and sustainable use of elasmobranchs.*

Considering the above, the following criteria were used in the assessment of the capacity to comply with the NDF requirements:

Management regime

This criterion evaluates whether the management regime in place adequately addresses known sources of mortality (e.g. direct catches vs. bycatch). The assessment focused on the established harvest control measures –national and regional, in the event the country is a member of a RFMO – as well as on any existing management plans for shark fisheries. The likely effectiveness of established measures in addressing known sources of mortality was evaluated by considering the types of fisheries that are catching sharks, the uses of shark catches, as well as any available information about the adequacy of management measures for shark fisheries (Musick and Bonfil, 2005; FAO, 2012). Other supporting information, such as the level of development and implementation of the NPOA-Sharks, NPOA-IUU and the ratification of the FAO Agreement on Port State Measures to Prevent, Deter and Eliminate IUU Fishing, was used in the assessment of this criterion. Updated information on the level of implementation of the international instruments was obtained directly from the countries (see questionnaire in Annex 1), from FAOLEX (FAO, 2016a) and from other sources (Fischer et al., 2012). A country was considered to have a minimum level of capacity in this criterion if it adopted an NPOA-Shark and enacted at least some management measures deemed to be reasonably effective in addressing the known sources of mortality of the listed species.

Supporting information

This criterion evaluates whether there is sufficient information to consider potential detriment and the setting of minimum precautionary measures, particularly when there is no effective management regime in place. The assessment focused on the available fisheries and biological data, and the capacity to monitor and assess the effects of adopted measures on population status (e.g. through stock assessment or the monitoring of fisheries-dependent and independent data). As none of the CoP17 listings had yet entered into force during the writing of this report, the analysis focused on species listed before and at Cop16. A country was considered to have a minimum level of capacity in this criterion if: catch data was available for each of the listed species (taxonomically disaggregated data); adequate monitoring of the catch and effort of the main fisheries catching sharks exists; the basic biological parameters needed for the definition of precautionary management measures were available.

Monitoring, Control and Surveillance (MCS) capacity

This criterion evaluates the current capacity and limitations in enforcing the management measures in place, considering the level of implementation of common Monitoring, Control and Surveillance tools, including logbooks, fishery observers, Vessel Monitoring Systems, monitoring of landings and port/sea inspections. A country was considered to have a minimum level of capacity in this criterion if all fisheries catching sharks were covered by a logbook system and port inspection controls in the majority of the landing points as a minimum.

2) Legal acquisition findings

The determination of legal acquisition involves different aspects, including the existence of appropriate legal frameworks for the implementation of fisheries and CITES regulations, the capacity to identify and verify the origin of the specimens in trade and to assess the compliance of the proposed trade with applicable laws (national and regional, in the case of species managed by RFMOs). The underlying fisheries MCS (covered in the NDF assessment) is key for adequate legal acquisition findings. Three additional criteria were used in the evaluation: the comprehensiveness of the legislation, the capacity to identify the species in trade and the capacity to trace the shark catches in the supply chain.

Legislation

This criterion evaluates whether the country has comprehensive legislation in place to regulate the catch and trade in sharks. It takes into account the regulations established in the national legislation as well as the norms established by the RFMO(s) of which the country is a member. With respect to the latter, due to lack of information, it was assumed that all norms established by RFMOs were adopted nationally. In addition to fisheries legislation, countries need national laws to implement and enforce all aspects of CITES. Although CITES is legally binding, states cannot fully implement it until specific domestic laws have been adopted for that purpose. As a minimum, national legislation must allow for the following aspects: i) designate at least one management authority and one scientific authority; ii) prohibit trade in specimens in violation of the Convention; iii) penalize such trade; or iv) confiscate specimens illegally traded or possessed. Under Resolution Conf. 8.4 (Rev. CoP15), national legislation is analysed by the Secretariat in relation to these four minimum requirements and placed in one of three categories, as follows:

- Category 1: legislation that is generally believed to meet the requirements for implementation of CITES;
- Category 2: legislation that is generally believed not to meet all of the requirements for the implementation of CITES;
- Category 3: legislation that is generally believed not to meet the requirements for the implementation of CITES.

A country was considered to have a minimum level of capacity for this criterion if legislation was in place regulating the catch, transport through the value chain and the export of the main commercially harvested species of shark, and if the legislation met all the minimum requirements for implementation of CITES (Category 1).

Species identification

This criterion evaluates the capacity to identify species in catches and in products in trade, through available identification guides, manuals and techniques, and trained human resources. The following were considered as minimum standards: the availability of manuals and field guides for the identification of species in the catch; field inspectors with some level of capacity to identify species in the catch; tools for identification of the main products in trade are available but not yet used locally.

Traceability

This criterion evaluates the capacity to verify the origin of specimens in trade within the country, in order for the export permit to be issued. The type of information considered included the current knowledge of the main supply chains for shark products and the existence of any catch/trade certification mechanisms that could be used to identify the origin and legality of the products in trade. The existence of a functional MCS system and any previous experience in implementing catch certification schemes were considered the minimum conditions to allow the verification of legal acquisition.

3) Institutional collaboration

Institutional collaboration is an important element to enable the implementation of the CITES requirements, relevant as it is to both non-detriment findings and legal acquisition. This criterion therefore evaluates how CITES and fisheries authorities are collaborating or are planning to collaborate for the implementation of the CITES requirements for the listed shark and rays. It also evaluated the extent of regional collaboration for fisheries assessment and management in general, as well as for shark fisheries assessment and management in particular, through bilateral/international agreements and projects or RFMOs. This section describes any planned or existing collaboration between CITES and fisheries authorities, in the context of the implementation of sharks listings, and the regional initiatives on technical and scientific issues of relevance to fisheries management. No minimum requirements were associated to this criterion.

RESULTS AND DISCUSSION

PART ONE

List of priority regions and countries

A total of 50 countries in four regions were selected as priorities for support with the implementation of CITES provisions for the management of sharks and rays (Figure 2; Table 2). The highest number of countries (19) was identified in Asia, followed closely by Africa (16) and America (12). A small number of prioritized countries (3) was identified in Oceania. Within each region, the results of the prioritization process revealed that the selection of countries was largely driven by the impact of their fisheries on shark resources (Criteria 1 and 2), although in some cases countries of importance in the trade of shark commodities also influenced the selection (Criterion 3). The prioritization of other countries was influenced by expert considerations under Criterion 4. This is the case of the SIDS in the Caribbean (Trinidad and Tobago, Suriname, Guyana) and Oceania (Papua New Guinea, Kiribati, Fiji) , which were included in the selection because of their high reliance on marine resources. In addition, Costa Rica, Sri Lanka and Ecuador were considered eligible candidates by virtue of reported catches of listed species and because of their request and evident interest in receiving assistance for the implementation of CITES listings. Uruguay was selected as a result of the significant trade in shark products. On the other hand, Tunisia and Libya were not selected because, in spite of high catch volumes (Criterion 2), they do not report either the capture or the trade of the CITES species, which are likely to be negligible in these countries. Considering the priority countries defined by Dulvy *et al.* (2017) based on the number of threatened shark species in each country's EEZ, and considering the likelihood of conservation and fisheries landings, the countries in the cluster defined as "low conservation likelihood yet high fisheries pressure" are almost all included in the list of countries selected based on the four criteria defined in this report; the only exception was the Philippines, which was added as a result of considerations relating to Criterion 4.

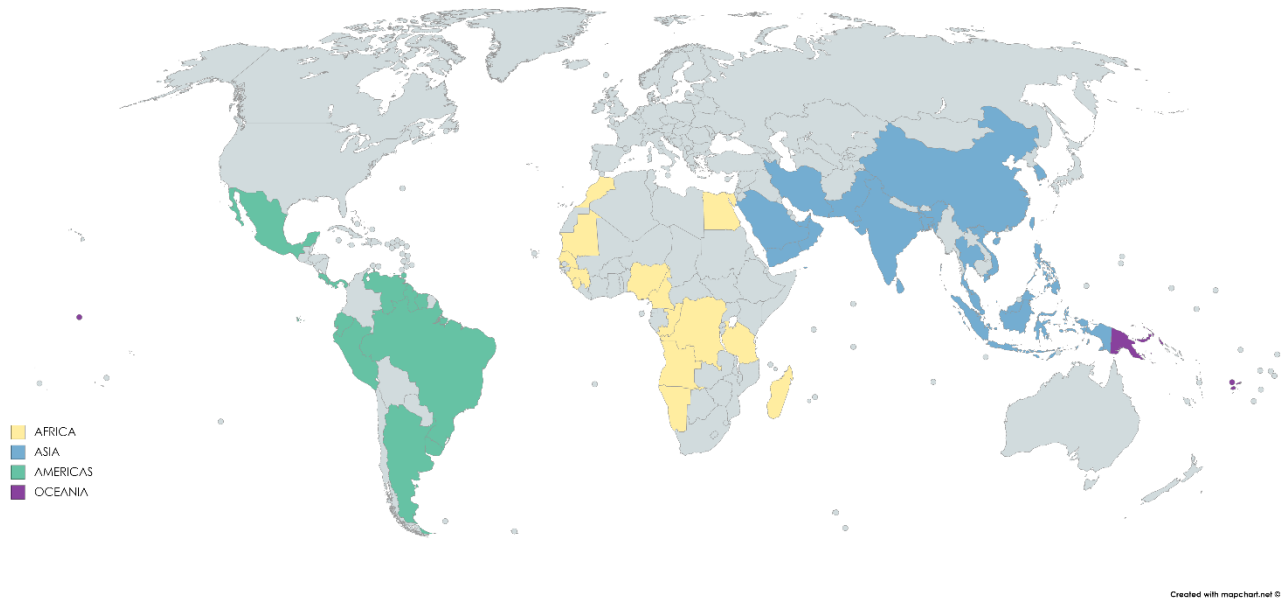

Figure 2. Map of priority regions and countries for supporting implementation of CITES provisions for management of sharks and rays.

Table 2. List of priority regions and countries/territories. For each country/territory, the columns C1, C2, C3 and C4 indicate methods).The countries/territories are ranked based on the numerical value of Criteria 1, 2 and 3; this arrangement is not intended as a priority rating.

#	AFRICA	C1	C2	C3	C4
1	Nigeria	✓	✓	✓	
2	Senegal	✓			
3	Namibia		✓	✓	
4	United Republic of Tanzania		✓		
5	Morocco		✓		
6	Cameroon		✓		
7	Egypt		✓		
8	Angola		✓		
9	Ghana		✓		
10	Sierra Leone		✓		
11	Democratic Republic of the Congo		✓		
12	Congo		✓		
13	Madagascar		✓		
14	Guinea		✓		
15	Mauritania		✓		
16	Zanzibar		✓		

#	ASIA	C1	C2	C3	C4
1	Republic of Korea	✓	✓	✓	
2	Thailand	✓	✓	✓	
3	Indonesia	✓	✓	✓	
4	Islamic Republic of Iran	✓	✓		
5	India	✓	✓		
6	Yemen	✓	✓		
7	Pakistan	✓	✓		
8	Taiwan Province of China	✓			
9	Malaysia	✓			
10	China		✓	✓	
11	United Arab Emirates		✓		
12	Oman		✓		
13	Saudi Arabia		✓		
14	Bangladesh		✓		
15	China, Hong Kong SAR			✓	
16	Singapore			✓	
17	Viet Nam			✓	
18	Sri Lanka				✓ae
19	Philippines				✓ab

#	AMERICAS	C1	C2	C3	C4
1	Mexico	✓			
2	Argentina	✓			
3	Brazil	✓			
4	Peru	✓			
5	Panama		✓	✓	
6	Bolivarian Republic of Venezuela		✓		
7	Trinidad and Tobago				✓d
8	Suriname				✓d
9	Guyana				✓ad
10	Costa Rica				✓ae
11	Uruguay				✓be
12	Ecuador				✓ab

#	OCEANIA	C1	C2	C3	C4
1	Papua New Guinea				✓d
2	Kiribati				✓d
3	Fiji, Republic of				✓a

Legend

a Country relevance for threatened species
b Data completeness
c Governance interventions that were being put in place
d SIDS and spatial balance of future implementation support
e Disposition of countries to receiving assistance

The main areas highlighted through this exercise as potentially in need for support were the western and northeastern Indian Ocean, the southwest and southeast Atlantic, and the central and northwestern Pacific. These areas coincide with some of the areas associated with high extinction risks for sharks globally, including areas in the Indo-Pacific (Finnegan *et al.*, 2015). Some specific areas reported as being very high-risk in the literature, such as southeast Africa and Oceania, included very few countries selected for this study, which concentrated on fishery and trade volumes as well as other criteria. This difference can be explained either because of the theoretical approach outlined by Finnegan *et al.* (2015) or an underestimation of the importance of certain areas, possibly due to official statistics and/or other supporting information.

PART TWO

In the list below, the 29 countries/territories underlined constitute the subset on which the current assessment was conducted (Annex 2). Bold formatting indicates the 21 new countries/territories selected as a priority in Part One; the 6 countries selected by Fisher and Barone (2013) are presented in italics, but they did not match the new criteria defined in this study.

AFRICA: Angola; **Cameroon**; **Congo**; the Democratic Republic of the Congo; **Egypt**; *the Gambia*; Ghana; Guinea; *Liberia*; **Madagascar**; Mauritania; **Morocco**; Namibia; Nigeria; Senegal; **Sierra Leone**; **the United Republic of Tanzania**; *South Africa*; **Zanzibar**.

ASIA: Bangladesh; China; **China Hong Kong SAR**; India; Indonesia; Iran (Islamic Republic of); Republic of Korea; Malaysia; *Maldives*; **Oman**; Pakistan; **the Philippines**; **Saudi Arabia**; Singapore; Sri Lanka; Taiwan Province of China; Thailand; the United Arab Emirates; **Viet Nam**; Yemen.

AMERICAS: Argentina; Brazil; *Chile*; Costa Rica; Ecuador; *El Salvador*; **Guyana**; Mexico; Panama; Peru; **Suriname**; **Trinidad and Tobago**; Uruguay; Venezuela (Bolivarian Republic of).

OCEANIA: Fiji; **Kiribati**; **Papua New Guinea**.

The main findings from the national and regional assessments are summarized in the sections below. With regard to the new countries selected in Part One and identified as potentially in need of capacity building support (e.g. Oceania and Caribbean countries), an assessment of their capacity to fulfil CITES requirements will still need to be completed, possibly as a component of future assistance for the conservation and management of sharks and rays in 2018–2019.

Fisheries and trade of listed shark species

The evaluation demonstrated that there are many different types of fisheries catching listed shark species in Africa, Asia and Latin America (Tables 3, 4 and 5); they include small-scale and industrial fisheries that operate in national waters and – in the case of some species and countries – also in international waters. In the majority of situations the species are not a target for a specific fishery but one of the bycatch species in multispecies fisheries. Target fisheries for sharks were more frequently found in Africa than in other regions. The species are consumed locally and exported, with different types of products in trade (meat, fins, skin, cartilage, teeth, oil, etc.). However, overall, the listed species have a minor importance to national fisheries, both in terms of volume and value, as reflected by the comparative lack of species-specific reporting from many countries.

Table 3. Summary information about fisheries and trade in the recently CITES listed shark species in selected African countries.The question mark (?) indicates uncertainty about the presence of any of the listed species.

Countries	FISHING AREAS		TYPE OF FISHERIES			TARGET		COMMERCIAL IMPORTANCE	
	National waters	International waters	Industrial	Small-scale	Recreational	Target	Bycatch	Domestic market	Export
Democratic Republic of the Congo	✓	–	–	✓	–	–	✓	✓	?
Ghana	✓	✓	✓	✓	–	✓	✓	✓	✓
Guinea	✓	✓	✓	✓	–	✓	✓	✓	✓
Mauritania	✓	–	✓	✓	–	✓	✓	?	✓
Namibia	✓	✓	✓	–	–	–	✓	–	✓
Nigeria	✓	–	✓	–	–	–	✓	✓	✓
Senegal	✓	–	✓	✓	–	✓	✓	✓	✓

Table 4. Summary information about fisheries and trade in the recently CITES listed shark species in selected Asian countries.

Countries	FISHING AREAS		TYPE OF FISHERIES			TARGET		COMMERCIAL IMPORTANCE	
	National waters	International waters	Industrial	Small-scale	Recreational	Target	Bycatch	Domestic market	Export
China	✓	✓	✓	✓	—	—	✓	✓	✓
India	✓	—	✓	✓	—	—	✓	✓	✓
Indonesia	✓	✓	✓	✓	✓	✓	✓	✓	✓
Iran	✓	?	✓	✓	—	—	✓	✓	✓
Republic of Korea	—	*?*	*?*	—	—	—	*?*	*?*	*?*
Malaysia	✓	—	✓	✓	—	—	✓	✓	?
Pakistan	✓	—	✓	✓	—	—	✓	✓	✓
Sri Lanka	✓	✓	—	✓	—	✓	✓	✓	✓
Taiwan Province of China	*?*	*?*	*?*	*?*	*?*	*?*	*?*	*?*	*?*
Thailand	✓	—	✓	—	—	—	✓	✓	✓
Singapore	—	—	—	—	—	—	—	*?*	*?*
Yemen	✓		*?*	✓		✓	✓	✓	✓
United Arab Emirates	*?*	*?*	*?*	*?*	*?*	*?*	*?*	*?*	*?*

Table 5. Summary information about fisheries and trade in the recently CITES listed shark species in selected Latin American countries.

Countries	FISHING AREAS		TYPE OF FISHERIES			TARGET		COMMERCIAL IMPORTANCE	
	National waters	International waters	Industrial	Small-scale	Recreational	Target	Bycatch	Domestic market	Export
Argentina	✓	—	✓	—	—	—	✓	—	—
Brazil	✓	✓	✓	✓	✓	✓	✓	✓	✓
Costa Rica	✓	✓	✓	✓	—	—	✓	✓	✓
Ecuador	✓	✓	✓	✓	—	—	✓	✓	—
Mexico[4]	*?*	*?*	*?*	*?*	*?*	*?*	*?*	*?*	*?*
Panama	—	—	—		—	—	—	—	—
Peru	✓	—	—	✓	—	✓	✓	✓	✓
Uruguay	✓	✓	✓	✓	—	—	✓	✓	—
Venezuela (Bolivarian Republic of)[5]	*?*	*?*	*?*	*?*	*?*	*?*	*?*	*?*	*?*

[4] Catches of "hammerhead sharks, etc. nei" reported to FAO.
[5] Catches of scalloped hammerheads *S lewini* reported to FAO.

Current limitations and needs

Table 6 summarizes the assessment of each country's capacity to fulfil the minimum requirements to implement the CITES Appendix II listings of sharks. Supporting information regarding each country's assessment is provided in Annex 2, while some general points about the current situation and needs of the countries in the different regions are highlighted below. Overall, only two countries (Argentina and Uruguay) were found to have all the minimum conditions to implement the CITES requirements for sharks. The capacity to implement these requirements was generally poorer in Africa than in the other two regions.

Several of the countries analysed have a management framework in place (legal regime and regulations for the control of harvest and trade in sharks) that could support the regulation of shark fisheries and therefore provide the basis for meeting the CITES requirements. As with most management, there is still opportunity for improvement in this area, especially in the design of additional precautionary measures for regulating the harvesting of sharks. However in many of the countries there are already basic management measures (directly or indirectly dedicated to sharks) that could address some of the sources of mortality.

The prohibition of finning is by far the most common measure directly designed for shark fisheries This measure, the main objective of which is to encourage the full utilization of sharks and avoid discards, has also been widely applied as a shark conservation measure. However, its effectiveness for the conservation of shark resources is still being questioned (Dent and Clarke, 2015), notably in the many situations where there is a market for both meat and fins.

The harvesting of manta rays for their gill plates and meat is the most poorly regulated activity across all regions; this is not surprising considering its rare occurrence, its sporadic presence in catches and relatively low importance to fisheries. The countries with weaker management capacity include important shark producers, such as Ghana and Nigeria in Africa and India and Pakistan in Asia. These countries received a low score because of the lack of an NPOA-Sharks and/or because the management measures in place are considered to be largely ineffective in addressing the sources of mortality of listed shark species. Improving these aspects should therefore be highlighted as one of the potential capacity development targets for these countries.

The majority of the countries analysed have established mechanisms of institutional collaboration that could facilitate the implementation of the listings: these include collaboration between FAO, CITES and fisheries authorities, as well as regional collaboration (through RFMOs) that could support the management of shared shark resources. The strategies used for instance in the Gambia, Namibia, Indonesia and Costa Rica can be considered good examples for other countries in the regions.

The available information (fisheries and biological) to support the making of NDFs is generally very poor across the regions, particularly in Africa and Asia. Improvement of the knowledge about these fisheries and resources is a major thematic area in capacity development; within this, some areas for future work include the collection of fisheries statistics from artisanal fisheries, the taxonomic disaggregation of shark catches and the estimation of basic biological parameters for the listed species.

One of the main barrier to a sound implementation of the listings is the poor fisheries monitoring, control and surveillance (MSC) capacity; of the countries analysed in Africa, only Namibia has the minimum required level of capacity in this criterion. Only two of the ten Asian countries analysed for this criterion were found to have the minimum level of capacity required. The situation in the few Latin American countries analysed is less critical, but the situation in the other countries of the region would probably be less favourable. The determining factor for the overall low capacity is the fact that in most countries sharks are caught predominantly by artisanal fisheries, which are inherently more difficult to control and monitor than industrial fisheries. This is not the case in the standout exception, Namibia, which has no artisanal fisheries for sharks.

There have been some interesting experiences with the involvement of fishers in participatory surveillance (e.g. Mauritania, Costa Rica), but these were very localized and generally not continuous. Strengthening the management of artisanal fisheries (such as through co-management) is an area for capacity development over the middle to long term. In the short term, mechanisms to facilitate the control of these fisheries must be considered. Measures that could facilitate a better understanding of fisheries and compliance by fisheries staff

and inspectors include the issuing of specific licenses for sharks fisheries (Guinea), the registration of shark fin traders (Brazil), the designation of authorized landing points for artisanal fish exports (Senegal), and the use of simple vessel tracking devices for artisanal vessels (e.g. GPS in Ghana). The feasibility of these and other measures for artisanal shark fisheries should be explored further. Another issue that deserves further attention is the impact and management of migrant artisanal fishers, which is common in the SRFC region in Africa, and has consequences for both fisheries and trade in sharks. Poor MCS capacity affects the overall capacity of countries to trace the origin and legality of catch and products in trade, and consequently the making of legal acquisition findings by CITES authorities. The experiences with catch documentation/certification schemes not necessarily related to sharks (e.g. the European Commission regulation to combat IUU fishing, catch certification by tuna RFMOs, etc.) are deemed to be positive for the future development of traceability mechanisms for shark exports. The development or adaptation of schemes to trace the products from artisanal fisheries – particularly for the Asian trade in fins and the regional trade in meat – is a topic that deserves further attention.

Improving the capacity to identify the listed species in catches and products in trade represent another main area for assistance. The existence of manuals and field guides for the identification of species in catches is noted throughout the national reports. Based on this evidence, the production of field guides specifically tailored to the local language and the realities of the fisheries in the countries seems a logical short-term action offering a rapid return. The existence of guides and software for the identification of fins has also been noted, and the training of customs officers in the use of these tools represents another short-term action for capacity development. For many countries the main limitation is the lack of capacity to identify species from the processed products in trade (e.g. meat, cartilage, oil, etc.). Genetic (molecular) techniques are viable alternatives, although these are very costly and therefore probably less likely to be used in West African countries. Exploring other means to facilitate the identification of species in these products is an open area for capacity building.

The results of this study should help to inform the discussion of where assistance in the delivery of capacity support for the conservation and sustainable use of shark and ray resources is most needed and likely to have the greatest positive impact on the sustainable management of the various resources. The authors recognize that other factors need to be taken into account which are beyond the criteria developed in this study, notably that further work is required to fill the knowledge gap in the trade of non-fin products, understand the complexity of the post-harvest processing sector and describe their roles and importance for livelihoods and food security. Direct requests for assistance from countries should also be considered a priority, as even small gains implemented with willing partners offer long-term benefits in the management and conservation of these vulnerable resources.

Table 6. Summary of the assessment of the capacity of selected priority countries to fulfil the requirements to implement the CITES Appendix II listings of sharks. ✓ indicates that country has the minimum required elements to fulfil the requirement; × indicates capacity below the minimum required; na: criteria not evaluated for lack of information.

	NON-DETRIMENT FINDINGS			LEGAL ACQUISITION FINDINGS		
	Management regime	Supporting information	MCS	Legislation	Species ID	Traceability
AFRICA						
Democratic Republic of the Congo	×	×	×	×	×	×
Ghana	×	×	×	×	×	×
Guinea	✓	×	×	×	×	×
Mauritania	✓	×	×	×	×	×
Namibia	✓	×	✓	✓	×	✓
Nigeria	×	×	×	×	×	×
Senegal	✓	×	×	✓	×	×
ASIA						
China	×	×	×	✓	×	×
India	✓	×	×	×	×	×
Indonesia	✓	×	×	✓	✓	×
Iran (Islamic Republic of)	×	✓	×	✓	✓	×
Republic of Korea	✓	×	✓	✓	✓	✓
Malaysia	✓	×	×	✓	✓	×
Pakistan	×	×	×	×	×	×
Singapore	na	na	na	✓	✓	✓
Sri Lanka	✓	✓	✓	×	✓	✓
Taiwan Province of China	✓	✓	na	na	✓	na
Thailand	×	×	×	✓	✓	✓
United Arab Emirates	×	na	na	✓	na	na
Yemen	×	×	×	✓	×	×
LATIN AMERICA						
Argentina	✓	✓	✓	✓	✓	✓
Brazil	✓	×	✓	✓	✓	✓
Costa Rica	✓	×	×	✓	×	×
Ecuador	✓	✓	✓	×	✓	✓
Mexico	✓	✓	na	✓	✓	na
Panama	na	na	na	na	na	na
Peru	✓	✓	na	✓	✓	na
Uruguay	✓	✓	✓	✓	✓	✓
Venezuela (Bolivarian Republic of)	na	na	na	na	na	na

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ANNEX 1. QUESTIONNAIRE SENT TO NATIONAL FOCAL POINTS

Name of country:

CHARACTERISTICS OF SHARK FISHERIES AND TRADE

1) Indicate in the Table below which of the following species are caught by fisheries in your country or by vessels flagged in your country. Indicate in each case the characteristics of the fisheries in terms of type, target, commercial importance and data availability.

Species	Fishing areas		Type of fisheries*			Target**		Commercial importance		Data availability***		
	National waters	International waters	Industrial	Small-scale	Recreational	Target	Bycatch	Local/ national market	Export	Landings	Discards	Fishing effort
Sphyrna lewini												
Sphyrna mokarran												
Sphyrna zygaena												
Carcharhinus longimanus												
Lamna nasus												
Manta spp.												

* Indicate the type of fishing gears used.
** In case the shark species are caught as part of the bycatch, indicate which are the target species of the fisheries.
*** Indicate the years of data available.

2) Characterize the relative importance of the species identified in question 1) for the local/national fisheries and in terms of export volume and value. Indicate the approximate number of people involved or benefiting from the capture and post-harvesting activities for these species, the value of catches, and any other relevant socioeconomic indicator.

3) Provide the following complementary information about the market for these species in your country:

i. Use of catches (partial/full local consumption, export (to which countries))
ii. Imports (from which countries)
iii. Flag states landing these species in your country (countries, products and volumes)
iv. Types of products in local trade (fins, meat, jaws, skin, etc.; fresh, salted, etc.)
v. Types of products that are exported (fins, meat, jaws, skin, etc.; fresh, salted, etc.)
vi. Volume of products in local and international trade.

DATA AVAILABILITY

4) Describe the existing fishery data collection systems and indicate their main limitations for monitoring the catches of the species identified in question 1).

5) Indicate the availability of data about the following biological aspects of these species in your country:

Parameters	Data available (yes/no)	Details: species, years, areas, references.
Size/age composition		
Growth		
Maturity		
Fecundity		
Reproductive cycle		
Nursery areas		
Other critical/essential habitats (e.g. aggregation sites for mating, feeding, cleaning)		
Mortality (natural, from fisheries (including post-release mortality), and from other anthropogenic factors)		
Temporal and spatial distribution		
Abundance trends		

6) Describe any existing stock assessment for these species in your country, or any stock assessment at international level that your country is or has been taking part in.

CITES REQUIREMENTS

7) How are permits and controls being established for international trade in aquatic species listed in CITES Appendices (including sharks)?

8) In case your country exported any of shark species currently listed in CITES Appendices[6], what approach has been used by CITES Authorities in your country to ensure that exports were not detrimental to the survival of the species (i.e. the establishment of a Non-Detriment Funding or NDF)?

9) What measures are in place to ensure that the export of species mentioned in question 1) have been legally fished?

10) Does your country have means to identify shark catches and shark products in trade (e.g. identification manuals, DNA techniques)?

INSTITUTIONAL ASPECTS

11) What is the legal framework (laws, decrees or by-laws) within which the fisheries described in question 1) are operating?

12) Is there a management plan in place for the fisheries described in question 1)?

13) Do you have a National Plan of Action (NPOA) for Sharks? If so, how is it being implemented and since when?

14) What are the institutional and administrative frameworks for fisheries management in your country (what agencies are involved and what are their responsibilities)?

15) Which are the national CITES Management and Scientific Authorities responsible for trade in CITES-listed shark species?

16) To what degree do CITES Authorities and Fisheries agencies work together concerning the export of CITES-listed commercially exploited aquatic species such as sharks?

17) Have there been any attempts (bilateral or through RFMOs) to approach other countries sharing these resources to discuss joint arrangements for assessing and managing the fisheries? Describe the motivation and outcomes of these processes?

MANAGEMENT MEASURES

18) Describe the full set of fisheries management and trade-related measures currently in place in your country that are of relevance for the species and fisheries identified above in question 1). Use the Table below to summarize all the relevant measures. Provide comments, as appropriate, on the effectiveness of the established measures in terms of ensuring the sustainable use of resources.

Management measures	Description	Effectiveness
Species-specific prohibitions (e.g. capture, sale, transport, etc.)		

[6] *Cetorhinus maximus* (App. II); *Carcharodon carcharias* (App. II); *Rhincodon typus* (App. II); Pristidae (App. I)

Spatial restrictions (e.g. closed areas, MPAs, etc.)		
Temporal restrictions (e.g. closed seasons)		
Catch restrictions (e.g. quotas)		
Gear restrictions (e.g. forbidden gears, limits to mesh size, etc.)		
Minimum size		
Product form restrictions (e.g., prohibited finning, required landing of fins attached to body, or fins to BW ratio)		
Participatory restrictions (e.g. licensing, TURFs, etc.)		
Limits to fishing capacity (e.g. max. number of vessels; fleet reduction program, etc.)		
Other: specify		

19) Does your country have the necessary means and resources for effectively implementing the management measures listed above? What are the main limitations for fisheries monitoring, control and surveillance (MCS)? Use the table below to summarize the status of common MCS mechanisms for the fisheries described in question (1).

Fishery	Logbook (yes/no)	Observers on board (% fleet)	Vessel Monitoring Systems (% fleet)	Fishery covered by dockside monitoring programs (yes/no)	Fishery regularly covered by sea and port inspections (yes/no)	Catch certification scheme (yes/no)
1						
2						
3						
4						

CURRENT LIMITATIONS AND NEEDS

20) What are in your view the main impediments for implementing the Appendix II listings of the shark species and manta rays indicated above?

21) What additional assistance might be helpful in enabling your country to successfully implement the listings of these species?

ANNEX 2: Country Reports

AFRICA

Democratic Republic of the Congo

SUMMARY INFORMATION ON FISHERIES AND TRADE IN SHARK SPECIES

Sharks are caught as bycatch in small-scale coastal fisheries. No further information is available on the types of fisheries and species composition of the catch. Amongst the listed species, only *Sphyrna lewini* was reported to be caught. However, considering the area of occurrence of the other two species, it is likely that all three species of hammerheads are caught in coastal waters of the Democratic Republic of the Congo. Catches of sharks and rays are reported only as Elasmobranchs "Sharks, rays, skates, etc." and Rajiformes "Rays, stingrays, mantas nei". The available statistics show an increasing trend in total capture production of marine species in the last decade, reaching around 4 000 tonnes/year in recent years (Figure 3). According to this data, the catches of sharks represent approximately half of the total marine catches of the Democratic Republic of the Congo in recent years. The different conflicts and civil war since the 1960s puts doubts on the reliability of the reported statistics from the Democratic Republic of the Congo.

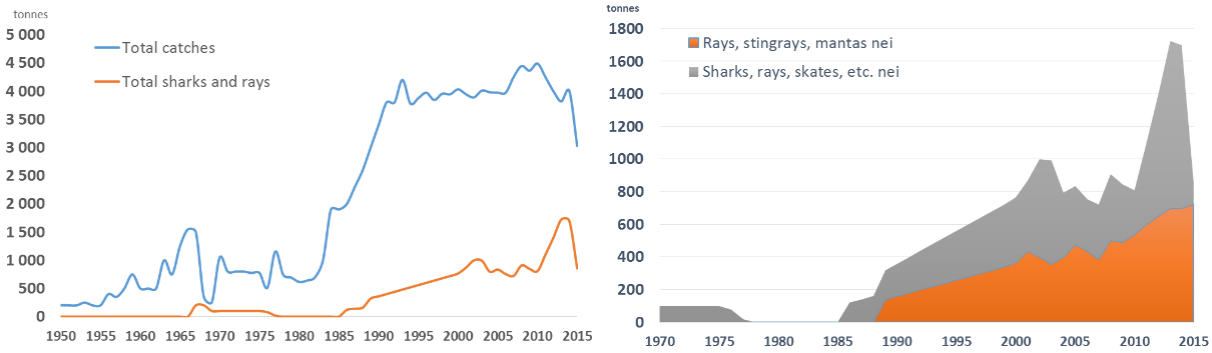

Figure 3. Marine capture fisheries production and the composition of the shark catches of the Democratic Republic of the Congo (Source: FAO, 2017a).

Sharks caught in artisanal coastal fisheries are mainly consumed locally (Province du Bas-Congo) or nationally. There are no officially validated data on the volume and value of shark exports. FAO trade data indicate a very small amount of shark fin exports from Democratic Republic of the Congo in recent years (Table 7), but the source of this data is questionable (Paulin K. Kad-Swam , pers. comm.). Also according to FAO trade data the country is a net importer of fish commodities and only exports small volumes of fish and other marine resources.

Table 7. Average (2008 – 2013) trade flow of shark products from the Democratic Republic of the Congo (FAO, 2016c).

Commodity (average 2008-2013)	Export		Import	
	Tonnes	USD'000	Tonnes	USD'000
Shark fins, dried, whether or not salted, etc.	13	430	...	...
Total sharks commodities	**13**	**430**	**...**	**...**
Total all marine fisheries commodities	**235**	**791**	**19 862**	**34 644**

ASSESSMENT OF NATIONAL CAPACITY TO IMPLEMENT CITES REQUIREMENTS

Non-detriment findings

Management regime

The 1937 Act regulates fishing in the Democratic Republic of the Congo. Currently, this law was revised and the revised bill is in parliament for ratification. The country has not yet developed an NPOA-Shark. The Democratic Republic of the Congo is a member of the following Regional Fisheries Bodies in the Eastern Atlantic Ocean: CECAF, COMHAFAT-ATLAFCO and COREP. The country has not ratified the FAO Port States Agreement and has not developed an NPOA-IUU. Very few management measures of relevance to the regulation of shark fisheries are in place. In the "ARRETE MINISTERIEL N°020/CAB/MIN/ECN-EF/12006" of 20 May 2006, two species of sharks (the great white shark *Carcharodon carcharias* and the whale shark *Ryncodon typus*) are reported in the list of the species partially protected in the Democratic Republic of the Congo. These species cannot be captured and/or traded without a certificate of wildlife exploitation. Table 8 summarizes the measures and assesses their effectiveness to address the known sources of mortality.

Table 8. Management measures of relevance to shark fisheries in the Democratic Republic of the Congo. The effectiveness of these measures in addressing the known sources of mortality is noted.

Management measures	Description	Effectiveness
Species specific prohibitions	Required certificate of wild exploitation for catch and trade great white shark *C. carcharias* and whale shark *R. typus*.	**Unknow**. Measure would be ineffective if the species are caught as bycatch. It is unknown if the certificate requires the demonstration of non-detriment to the relevant species.
Spatial restrictions	Coastal strip within the Mangroved Marine Park partially protected (the Mangroves Marine Park has an area of 768 km2 and covers in addition to the coastal strip, land area along the mouth of the Democratic Republic of the Congo River and mangrove islands). Industrial fishing is prohibited within a 5 km-wide area measured from the shoreline.	**Low.** Area under (partial) protection small compared to the species distribution. Space restrictions are not observed among fishermen. **Low.** Prohibited industrial fishing in the inshore zone ineffective for addressing the catches of artisanal fisheries.
Gear restrictions	Prohibited use of beach seine. Minimum mesh size of 10 mm.	**Unkown.** The effect of beach seine prohibition on hammerhead catches is unknown. **Low**. Mesh size ineffective for hammerhead sharks.
Catch restrictions	Prohibited discarding any fish or part thereof.	**Low.** Ineffective for artisanal fisheries targeting sharks for local consumption.
Participatory restrictions	Required licenses to fish.	**Low.** Ineffective if not used to limit access (there are no limits to the number of licenses issued).

Supporting information

The collection of fishery statistics in Moanda (coastal Democratic Republic of the Congo) was initiated by FAO to enable the government of the Democratic Republic of the Congo to know the production of artisanal fisheries in coastal waters. With the ending of the FAO project in the 1990s, the collection of fisheries statistics was suspended and became almost non-existent to date. Shark catches are highly aggregated and could not be used to evaluate trends in the stocks of the listed species. No biological studies on sharks and rays have been conducted in coastal Democratic Republic of the Congo until now. The country participated in surveys of the Norwegian research vessel D/V Fridjtof Nansen, but survey reports do not have data on any of the listed species (Mr Paulin K. Kad-Swam, pers. comm.). None of the populations of the listed species is currently assessed in Democratic Republic of the Congo or elsewhere in West Africa.

Monitoring, Control and Surveillance (MCS) capacity

The country has no means or capacity to enforce the fisheries regulations summarized in Table 8. Due to the lack of an industrialised fleet, there are no dedicated fisheries ports. The MCS capacity is considered extremely limited (MRAG and CapFish, 2008; www.stopillegalfishing.org). The small-scale fishery is not covered by any of the common fisheries MCS tools listed in Annex 3. Under the current limited MSC capacity it will be practically impossible to verify if products in trade were obtained in compliance with the norms in place. From the information gathered, it seems that improvements in the governance of the Mangroves Marine Park could have some positive effects on the management of artisanal fisheries catching sharks in coastal waters of Democratic Republic of the Congo. However this will require addressing current constrains such as the limited sources of funding for the Park, the need for raising conservation awareness and finding alternative livelihoods for local people (UNEP, 2013). The level of IUU fishing in Democratic Republic of the Congo is uncertain but considered to reach high levels in the inshore industrial fisheries and medium levels in the coastal artisanal fisheries (MRAG and CapFish, 2008). Fishing without licence, misreporting of catches, transhipping, and fishing in closed areas and times were some of the common IUU issues identified in the country and associated to high socioeconomic and biological impacts (MRAG and CapFish, 2008). There are no more recent information on the levels of IUU fishing in the country.

Legal acquisition findings

Legislation

As discussed above, the 1937 Act regulates fishing in the Democratic Republic of the Congo. This law was revised and the revised bill is in parliament for ratification. Very few management measures of relevance to the regulation of shark fisheries are in place and these are summarized in Table 8. According to the evaluation conducted by the CITES Secretariat[7], the country's legislation meets all the minimum requirements for the implementation of CITES (Category 1).

Species identification

According to the information obtained from Mr Léonard Muamba Kanda, Chief Director, Service for the Nature Conservation, Democratic Republic of the Congo, currently lacks the means to identify the shark species in catches and in products in trade (both fins and meat). All shark catches are lumped into a single reporting category (Figure 3). Species identification guides are available for the region (see Annex 5) and could eventually be used to produce identification guides for local inspectors. Likewise the tools being developed for the identification of fins listed in Annex 5 could be useful for the verification of fins in trade by customs officers. Appropriate training would be needed to make effective the use of these tools.

Traceability

There is no information on the trade of shark products from the Democratic Republic of the Congo. Under the current limited capacity for monitoring the small-scale fisheries catching sharks, it will be practically impossible to determine the origin of the products in trade. It is worth noting that since 2006 the catch and trade in *C. carcharias* and *R. typus* needs to be accompanied by a certificate. If appropriately implemented,

[7] CoP17 Doc. 22 Annex 3 (Rev. 1) Status of legislative progress for implementing CITES (updated on 1 September 2016).

this would help trace the origin of legally caught specimens. No similar mechanisms exist for the other more commonly harvested species.

Institutional collaboration

There are no reported ongoing interactions between CITES and fisheries authorities for the implementation of the new listing of sharks and manta rays.

At the national level, some collaboration between the Mangroves Marine Park authorities and the Coast Guard for the surveillance of the littoral zone seems to have occurred in the past. No information could be obtained on the results and prospects for continuing this collaboration in the future.

At the sub-regional level, Democratic Republic of the Congo is a member of the Southern African Development Community (SADC), an inter-governmental organization (involving a total of 15 countries, including Democratic Republic of the Congo, Angola, Namibia and South Africa in the Atlantic coast) established in 1980 with the objective to foster regional integration for achieving development, peace and security, and economic growth, to alleviate poverty, enhance the standard and quality of life of the peoples of Southern Africa (www.sadc.int). In 2001 the SADC adopted a Protocol on Fisheries (a binding document) to support national initiatives and international conventions for the sustainable use and protection of the living aquatic resources and aquatic environment of the region. The Protocol emphasizes the responsibilities of Member States, international relations as well as the effective management of shared resources. In signing this Protocol the Member States agree to harmonise their domestic legislation with particular reference to fisheries and the management shared resources, to take adequate measure to optimize fisheries law enforcement resources and thus protect aquaculture and the aquatic environment and safeguard the livelihood of fishing communities. So far, the Democratic Republic of the Congo has had little or no involvement in marine fisheries management programs developed under the SADC (e.g. BENEFIT, BCLME).

The Democratic Republic of the Congo has been working with Gabon, Angola and the Republic of Congo in the development of a management plan for the shared stock of sardine. This sub-regional collaboration opens an interesting precedent for an eventual cooperation on sharks among the countries in the sub-region.

The Democratic Republic of the Congo participates in the Stop Illegal Fishing (SIF) programme of NEPAD's Partnership for African Fisheries (PAF). The objective of SIF is to strengthen cooperation and coordination between governments and partners (including IGOs, NGOs, and CSOs) in order to support regional and international processes to stop illegal fishing in African waters. SIF's work focuses on building knowledge and experience of tools, systems and policy requirements to tackle illegal fisheries production and trade.

The Republic of Ghana

SUMMARY INFORMATION ON FISHERIES AND TRADE IN SHARKS

In Ghana sharks are targeted together with other large pelagic fish (billfishes and tunas) by small-scale drift gill net fisheries. The nets operate on the surface or at certain distances below it, and drift freely with the current. They vary in length between 180-650 m and often between 2-50 m in height. Usually they are operated by 10-12 fishers with an out-board engine driven canoe. The nets are set any time after sunset and hauled several times during the night. Meshes range from 45-50 mm. This fishery operates mainly in national waters. Sharks are also caught as bycatch in other artisanal (fixed set nets) and industrial fisheries (bottom trawls and tuna purse seiners). The unreported catches from the industrial trawlers are recognized as an important bottleneck for the assessment of shark catches. Sharks caught in bottom trawlers are often discarded after fins are taken on board. Total reported catches (FAO FishStat, 2017a, Figure 4) fluctuated considerably in the last decade, being on average close to 2 000 tonnes/year and increasing recently up tp 8 000 tonnes in 2012. The highest catches on record were 11 478 tonnes in 1975. Catches are highly taxonomically aggregated. In only three years (2008; 2014; 2015), catches of hammerheads and blue shark were separated from the rest. None of the listed species of sharks and rays appear in the list of main species of sharks harvested in Ghana (FAO, 2009). In general, shark catches represent a minor percentage of the total marine catches (1.6 percent in recent years). The economic contribution at national level is also presumably low, despite the high value of the fins. Sharks are however locally important to fishing communities as a source of fast cash used in the repair of boats and the purchase of fishing gears (FAO, 2009).

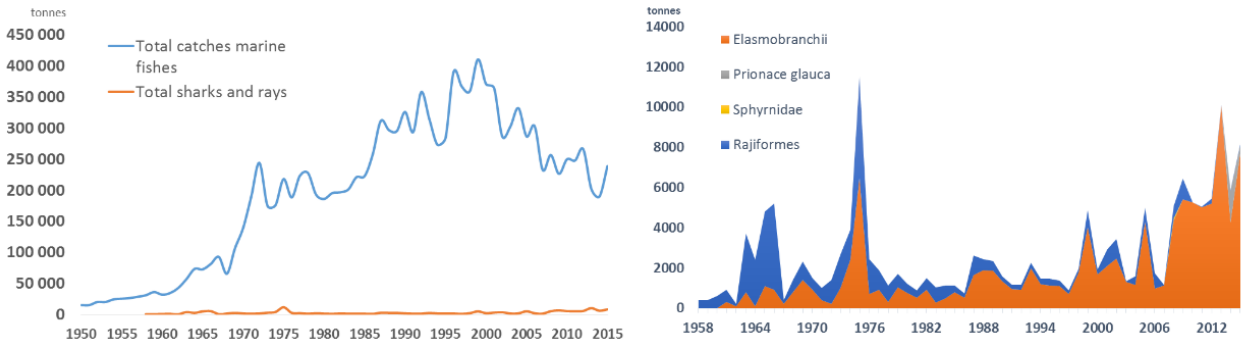

Figure 4. Marine capture fisheries production and the composition of the shark catches of Ghana (Source: FAO, 2017a).

The Ghanaians are present in large numbers in every sector of the shark fishing business in all countries of the Sub-regional Fisheries Commission (SRFC), being involved in fishing, sale, collection and processing of shark products (Diop and Dossa, 2011). There are currently 976 cannoes involved in the target driftnet fishery, involving directly 7 808 fisheries and indirectly 1 220 people (data from census conducted by the Ministry of Fisheries and Aquaculture Development).

Fish is recognized as the most important source of animal protein in Ghana (average per capita fish consumption estimated at 20 – 25 kg/year; FAO Country Profile). Shark meat is important as food for local populations, being sold fresh or salted. The export of meat from Ghana is considered less important than the local consumption. The average reported exports of shark fresh, chilled and frozen were 183 tonnes/year, from 2009 to 2013 (Table 9). Fins are traded within the sub-region and have the Asian market as the final destination. Ghana imports shark products from other West African countries, especially from Gambia and Senegal. The value of meat depends on abundance or supply of more popular fish species, such as the mackerels and sardinellas, but usually fetches low prices (USD 2-4 per kg). Fins on the other hand are valued between USD 20-30 per kg. The market of fins provides fishers with a source of "fast cash" needed for maintenance of gears and vessels. The actual value of the fin trade is unknown, considering that fins are often traded in the black market and the actual volume traded in unknown. In fact there are no records of shark fins export from Ghana in the FAO trade database since 1997 (Table 9).

Table 9. Average (2008 – 2013) trade flow of shark products from Ghana (FAO, 2016c).

Commodity (average 2009–2013)	Export		Import	
	Tonnes	*USD'000*	*Tonnes*	*USD'000*
Sharks nei, fresh or chilled	7	15	0	0
Sharks nei, frozen	175	195	0	0
Total shark commodities	**183**	**210**	**0**	**0**
Total all marine fisheries commodities	**21 889**	**53 873**	**283 220**	**215 898**

ASSESSMENT OF NATIONAL CAPACITY TO IMPLEMENT CITES REQUIREMENTS

Non-detriment findings

Management regime

The Fisheries Act 625 of 2002 and the Fisheries Regulation of 2010 (L.I. 1968) provide the legal framework within which shark fisheries operate in Ghana. In the recent years, the Fisheries Act 625 of 2002 was amended by the Fisheries (Amendment) Act, 2014 (Act No. 880) and the Fisheries (Amendment) Regulations (L.I. 2217 of 2015) and introducing concepts and regulations concerning measures to deter and eliminate Illegal, Unreported, and Unregulated (IUU) Fishing. In fact, in 2014, Ghana adopted the NPOA-IUU, developed in accordance with the principles and provisions of the IPOA IUU and the IUU Regional Plan of Action developed by the Fisheries Committee of the West and Central Gulf of Guinea (FCWC-RPOA-IUU). There is no specific management plan for shark fisheries. The country is a member of the Fishery Committee for the Eastern Central Atlantic (CECAF), the Ministerial Conference on Fisheries Cooperation among African States Bordering the Atlantic (ATLAFCO/COMHAFAT), the Fishery Committee of the West Central Gulf of Guinea (FCWC) and of the International Commission for the Conservation of Atlantic Tunas (ICCAT). Ghana has ratified the FAO Port State Measures Agreement in 2016. Table 10 summarizes the main norms regulating the fisheries catching sharks in Ghana and assesses their effectiveness to address known sources of mortality. Migration is an integral aspect of the artisanal fishing in Ghana, and many fishers migrate beyond Ghana to fish. The possible impact of this on the management regime for sharks in West Africa region still needs to be addressed.

Table 10. Management measures of relevance to shark fisheries in Ghana. The effectiveness of these measures in addressing the known sources of mortality is noted.

Management measures	Description	Effectiveness
Species prohibitions	Prohibited catch and trade of thresher sharks of the species *Alopias superciliosus*, oceanic whitetip sharks, hammerhead sharks (except for the *Sphyrna tiburo*) and silky shark in tuna fisheries regulated by ICCAT. Developing coastal states are exempted from the prohibition to catch hammerheads for local consumption. Those exempted are required to report catch data at least at the genus level, to avoid increase in hammerhead catches and ensure that hammerheads of the family Sphyrnidae (except of *Sphyrna tiburo*) will not enter international trade (ICCAT Recommendations 09-07 2009, 10-07 2010, 10-08 2010, 11-08 2011). Moreover, porbeagle should be promptly released unharmed, to the extent practicable (ICCAT Recommendation 13-10 2013).	**Medium–High**: The small-scale drift net fisheries are also subject to ICCAT recommendations, considering that it targets both tunas and sharks. If an exemption is requested (because of local meat consumption), a ban in trade of meat and fins will have to be implemented. Full compliance could result in an increase in the release of live hammerheads and a decrease in fishing mortality.

Management measures	Description	Effectiveness
Spatial restrictions	Prohibited fishing with industrial fishing vessels (larger than 22 m) in the Inshore Economic Zone, defined as the coastal waters between the coastline and the 30-metre isobath or the 6 nautical miles offshore limit, whichever is farther. No towing gear is allowed in this zone.	**Low-Medium**: no effect on the target artisanal fishery. Protection from trawling in coastal areas could protect reproductive habitat of hammerheads in coastal waters.
Gear restrictions	Minimum mesh sizes: driftnets (45 mm); multifilament set nets (50 mm); fish trawl nets (60 mm); shrimp trawl nets (50 mm); small-pelagic purse seine (25 mm); large pelagic purse seine (100 mm). Prohibited use of shrimp net without a Turtle Excluder Device (TED). Prohibited any driftnet fishing activities (small-scale driftnets "nifa nifa" used in the main target shark fishery is exempted from this rule (Samuel Quaatey, Dir. Fisheries, pers. comm.).	**Low-Medium**: minimum mesh size unlikely to have an effect on hammerhead selectivity. The implementation of TEDs could increase the escapement of large sharks from shrimp trawl nets (e.g. Brewer *et al*., 2006). The prohibition of large drift nets prevents the increase in fishing effort of individual units. However the law lacks an accurate definition of the size of the drift nets that is forbidden and needs to be revised (Paul Bannerman, pers. comm.)
Minimum sizes	Prohibited the capture and storage on board of any juvenile fish.	**Medium**: the measure can protect juvenile portion of the stock if individuals below minimum size are released alive and the post release survival is high. The minimum size for sharks needs to be defined to make this measure enforceable.
Product form restrictions	Prohibited finning of sharks before landing. Required 5 percent fin-to-body weight ratio for finned sharks on board vessels involved in tuna fisheries regulated by ICCAT.	**Low-Medium**: low for target fishery for meat and fins (among artisanal fishers it is taboo to land fish without fins); medium for the bycatch fishery, if means of enforcement are available. Fins are currently unreported.
Participatory restrictions	Required licenses for small-scale, semi-industrial and industrial vessels.	**Low**: low effectiveness if not used to limit access.

Supporting information

The Fisheries Scientific survey division of the Ministry of Fisheries conducts statistical sampling surveys on a regular basis. The surveys cover also the shark catches by the target small-scale driftnet fishery with canoes. The information collected includes catch weight and value, effort (duration of absence), number of crew and number of canoes that landed on the sampling day. However, shark catches are lumped together in highly aggregated taxonomic groups (Figure 4) that do not allow the evaluation of trends in catches or abundance of individual species. Also, unreported catches from the industrial trawlersare recognized as a bottleneck for the monitoring of trends in these resources. The biological sampling of catches is lacking and biological parameters of the listed species are virtually unknown. None of the populations of the listed species is assessed in Ghana or anywhere in West Africa.

Monitoring, Control and Surveillance (MCS) capacity

The small-scale fishery does not have logbooks, observers or Vessel Monitoring Systems. GPSs are being placed on a few canoes to monitor their spatial-temporal distribution. The fishery is partially covered by dockside monitoring programs for the collection of catch and effort data and only occasionally covered by fishery inspections (Annex 4). The MCS capacity to cover the other fisheries that capture sharks as bycatch is unknown. According to Bortey and Nunoo (in press) a VMS was commissioned in November 2005 to help monitor and control industrial fishing. By 2006, 70 industrial fishing vessels were equipped with these devices and plans were in place to cover the remaining part of the fleet. The weak fisheries enforcement capacity of Ghana encourages illegal fishing activities in both artisanal and industrial sectors. Concerns about illegal fishing by Ghanaian-flagged vessels have resulted, for instance, in several shipments of tuna being held up or refused to entry the EU market in the past (www.stopillegalfishing.com). The main IUU fishing activities in Ghana include fishing without licence, catch misreporting, harvest of protected species and the use of illegal gears. Illegal incursions of industrial vessels in the Inshore Exclusion Zone reserved for artisanal fisheries and the illegal incursion of foreign vessels in Ghana's waters are also noted as important issues (http://www.stopillegalfishing.com). According to Falaye (2008) the fish losses caused by IUU fishing can reach US $ 100 000 per day.

Legal acquisition findings

Legislation

The Fisheries Act 625 of 2002, the Fisheries Regulation of 2010 (L.I. 1968) and the Environmental Protection Agency regulations (not accessed in this report) provide the legal framework within which shark fisheries operate in Ghana. The adopted regulations (including national regulations and those established by ICCAT) are summarized in Table 10. The country's legislation does not meet the minimum requirements for the implementation of CITES (Category 3). A specific bill addressing these requirements is expected to be enacted soon[8].

Species identification

Ghana currently lacks the means and capacity to identify the species in shark catches and shark products in trade. The lack of field guides and trained staff are among the main limitations (FAO, 2009; P. Bannerman, pers. comm.). In fact the reported catches of sharks from Ghana are taxonomically aggregated in general categories that do not allow the evaluation of catches of listed species (Figure 4). The Volume II of the FAO Regional Guide on Eastern Central Atlantic, published in 2016, covers the area of interest and it is a good material to improve the capacity of field sampling staff to identify the sharks and rays species in the catch (Annex 5). No tools are currently available locally for the identification of species from products in trade. The use of fin guides (as described in Annex 5) seems a more feasible alternative to DNA techniques in routine checking by customs officers. Training in the use of fin guides would be needed. On the other hand there are no readily available methods for the identification of the species from the processed (dried, smoked) meat that is traded sub-regionally. Genetic (molecular) identification tools are available (Mundy-Taylor and Crook, 2013), but because of the high costs they are unlikely to be used as part of routine screening processes.

8 CoP17 Doc. 22 Annex 3 (Rev. 1) Status of legislative progress for implementing CITES (updated on 1 September 2016).

Traceability

Tracing the origin of fins in trade would be a real challenge considering that fins traded from Ghana include sharks harvested not only in Ghana but also in other West African countries. Fins are currently traded in the black market and there seems to be little knowledge of the supply chain and trade routes. At the moment there are no mechanisms in place that could be used to trace the origin of sharks harvested by the main artisanal targeted fishery. This fishery is not covered by logbooks or any form of catch documentation. Statistical sampling programs, used in the estimation of shark catches, are not census-based and therefore cover only part of the fleet (FAO, 2009). The importance of the reported catches in international waters is unclear, but likely to be low considering the more neritic distribution of hammerheads. According to Paul Bannerman (pers. com.) the small-scale driftnet fishery can sometimes fish beyond the limits of the EEZ. Tracing the origin of these high seas' catches would require, at a minimum, logbook and VMS data that are currently unavailable. Any specimen of the listed sharks caught beyond national jurisdiction would require a certificate of Introduction from the Sea, which will be a novelty for CITES authorities. According to the CITES Trade database the only commercially exploited aquatic species exported from Ghana in the last 5 years were seahorses (*Hippocampus* spp.). No information on the procedures for legal acquisition findings for these specimens could be obtained from the CITES management authority.

Institutional collaboration

According to the information obtained from CITES and fisheries authorities present at the Regional consultative workshop (Casablanca, 12-13 February 2014), working links between the two institutions are on course but are considered informal at this stage. The lack of regional coordination on the collection of information on transboundary stocks of sharks is recognized as an important limitation (P. Bannerman, pers. comm). However as a party to ICCAT, Ghana is subject to regionally adopted measures for the conservation of sharks and for the monitoring of catches in tuna fisheries (including in Ghana's case, the small-scale driftnet fisheries for sharks and large pelagics). As a contracting Party, Ghana is required to report shark catches according to ICCAT data reporting requirements, including any discards or releases of oceanic whitetip and hammerheads. Although Ghana's representative reported that these measures are being implemented in the country, the actual level of compliance is unknown.

Ghana participates in the Stop Illegal Fishing (SIF) programme of NEPAD's Partnership for African Fisheries (PAF). The objective of SIF is to strengthen cooperation and coordination between governments and partners (including IGOs, NGOs, and CSOs) in order to support regional and international processes to stop illegal fishing in African waters. SIF's work focuses on building knowledge and experience of tools, systems and policy requirements to tackle illegal fisheries production and trade.

Guinea

SUMMARY INFORMATION ON SHARK FISHERIES AND TRADE

In the Gulf of Guinea, requiem sharks (Carcharhinidae) and hammerheads (Sphyrnidae) are especially important in local fisheries, but considerable numbers of threshers (Alopidae) and makos of the genus *Isurus* are fished offshore. Silky shark is abundant or was formerly abundant in the Gulf of Guinea, and one of the most common tropical oceanic sharks in the Eastern Central Atlantic (Diop and Dossa, 2011b). Sharks are mainly caught by a targeted artisanal fishery (using gillnets and longline gears) that operates particularly around the Loos Islands, off Koba, and in the zone near Boké (Katcheck islands, Alkatraz, and the port at Kamsar) and Kassa. The artisanal shark fishery is conducted by migrant Senegalese and Ghanaian fishers, who stay in Guinea on a temporary or permanent basis. A total of 120 boats and 1 250 fishers are involved in the shark fisheries, with an additional 130 people involved in the processing of shark catches. The species are also caught as bycatch in industrial trawling fisheries. According to Diop and Dossa (2011b) the industrial fisheries in Guinea generated one of the highest volumes of elasmobranch bycatch in West Africa. Also, according to the authors the bycatch of foreign fleets (mainly from China) was likely to be high but were poorly monitored. No more recent information was available to assess any changes in the situation. Catches of sharks and rays started to be reported to FAO in the mid-1990s and has showed strong oscillations since then (Figure 5). With the exception of blue and shortfin mako sharks, all other species are reported in the single broad category of "sharks, rays, skates, etc. nei". As in other countries in the region, sharks represent only a minor proportion of the total marine landings in Guinea (1.9 percent of the total in recent years) and currently the catches reported are zero.

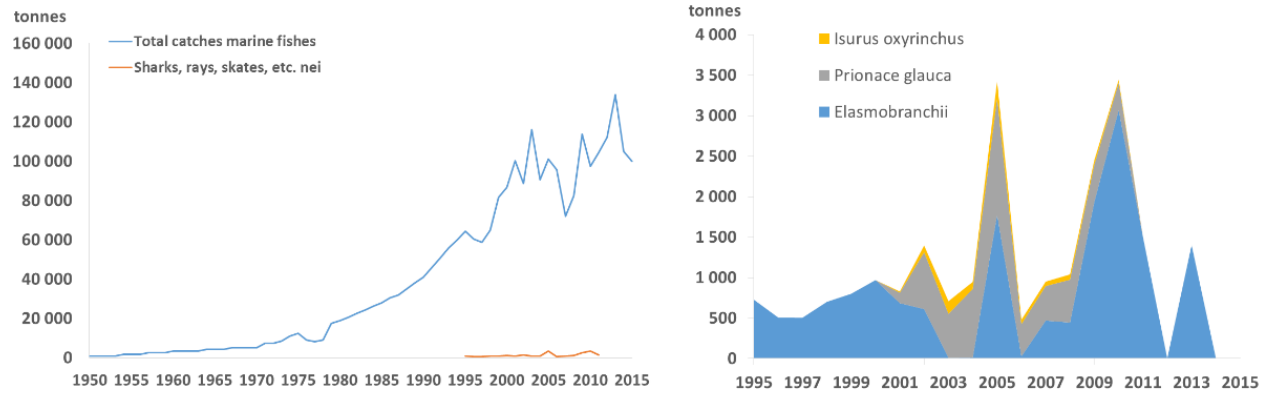

Figure 5. Marine capture fisheries production and the composition of the shark catches in Guinea (Source: FAO, 2017a).

There are three main trade networks (Diop and Dossa, 2011; Figure 6): the local market for meat (smoke-dried and fresh), the regional market for meat (salted and dried or smoked) to neighbouring countries (Ghana, Sierra Leone, Liberia, Côte d'Ivoire and Nigeria), and the South East Asia market for fins. As observed in other countries of the sub-region, the fishery is financially supported by boat owners, who supply the shark fins traded to Asian markets. Part of the meat is traded regionally by Ghanaian wholesalers, after the fish has been salted and dried, and part of the meat is marketed locally (fresh, salted or smoked) by Guinean wholesalers.

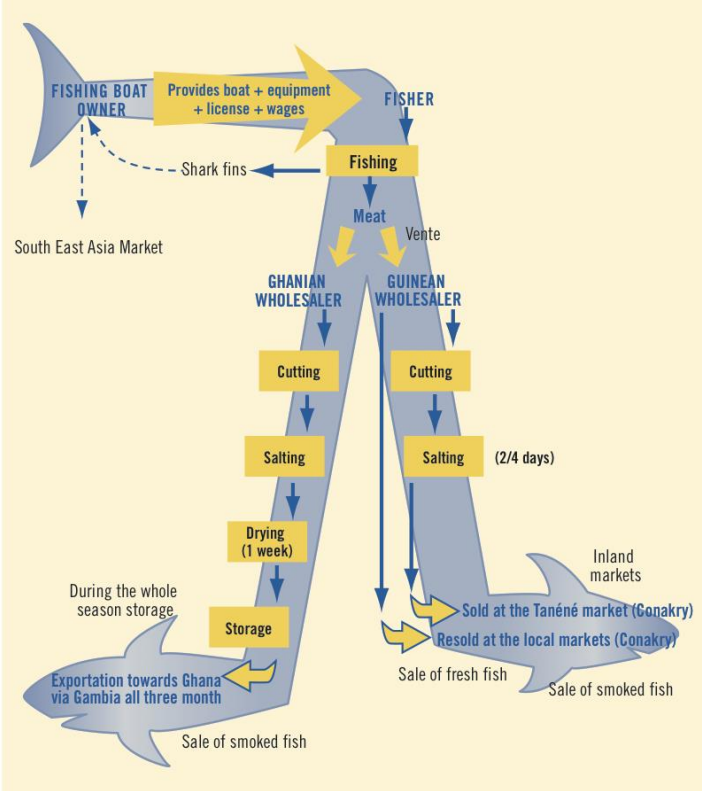

Figure 6. Market chain of shark products in Guinea (source Diop and Dossa, 2011)

According to national trade data, the average volume of fins traded in recent years was 87.8 tonnes/year. Lower volumes are found in the FAO trade database, which indicates an average of 44 tonnes over the period 2008–2013 (Table 11). In volume terms the shark trade represents 5 percent of the total trade of marine commodities from Guinea. In value terms, the shark trade is responsible for 30 percent of the total trade, the difference explained by the high value of the fins (average USD 56 per kg, according to the data in Table 11).

Table 11. Average (2008 – 2013) trade flow of shark products from Guinea (FAO, 2016c).

Commodity (average 2008-2013)	Export		Import	
	Tonnes	USD'000	Tonnes	USD'000
Shark fins, dried, whether or not salted, etc.	44	2 462		
Total sharks commodities	**44**	**2 462**		
Total all marine fisheries commodities	**8 193**	**7 398**	**1 421**	**1 921**

ASSESSMENT OF NATIONAL CAPACITY TO IMPLEMENT CITES REQUIREMENTS

Non-detriment findings

Management regime

The main legal framework for marine fisheries management is provided by the Law *n°2015/26/AN of 14 September 2015 on the Code of Marine*" repealing the Act L/95/13/CTRN of 15 May 1995, implemented by: decree D/97/017/PRG/SGG establishes the fines for violations of the Marine Fisheries Code; ordinance n° 1629/MPA/2009/SGG, on a system for positioning and locating industrial fishing vessels and the requirement to install the instrument on board. Other specific ordinances establish management measures for each type of fisheries, including Ordinance N° 0602/95/MPA/CAB of 31/01/1995 for industrial fisheries and Ordinance N° 00676/MPA/SGG/2006 for the artisanal fisheries. Of particular relevance to sharks, the latter establishes specific licence conditions for the target artisanal fisheries for sharks and also adopts a participatory approach for the management of artisanal fisheries. The Code of Marine Fishing provides for the elaboration of annual fishing plans to ensure that fishing effort is commensurate with the productive capacity of the fishery resources

and their sustainable use. The fishing plans are essentially devoted to industrial fishing, and therefore do not cover the coastal artisanal fisheries. Table 12 summarizes the main measures of relevance to shark fisheries adopted nationally and by Regional Fisheries Bodies. Guinea is a party to the following RFBs: CECAF, COMHAFAT-ATLAFCO, ICCAT and SRFC. Of these, ICCAT is the only one that adopted specific management measures for sharks. SRFC, on the other hand, adopted a Sub-Regional Plan of Action for Sharks in 2001 (PSRA-Requins) that has been instrumental to awareness raising and to the development of capacity of Member States on shark conservation and management, leading for instance to the adoption of Guinea's NPOA-Sharks in 2006. The country has not ratified the FAO Port States Agreement, but did the accession to the agreement on 03 June 2016. Guinea has not developed an NPOA-IUU.

Table 12. Management measures of relevance to shark fisheries in Guinea. The effectiveness of these measures in addressing the known sources of mortality is noted.

Management measures	Description	Effectiveness
Species prohibitions	Prohibited catch and trade of thresher sharks of the species *A. superciliosus*, oceanic whitetip sharks, hammerhead sharks (except for *S. tiburo*) and silky shark in tuna fisheries regulated by ICCAT. Developing coastal states exempted from the Developing coastal states are exempted from the prohibition to catch hammerheads for local consumption. Those exempted are required to report catch data at least at the genus level, to avoid increase hammerhead catches and ensure that hammerheads will not enter international trade (ICCAT Recommendation 09-07 2009, 10-07 2010, 10-08 2010, 11-08 2011). Moreover, porbeagle should be promptly released unharmed, to the extent practicable (ICCAT Recommendation 13-10 2013).	**Low.** The importance of catches of the listed species in tuna fisheries regulated by ICCAT is likely to be low. Industrial trawling and artisanal fisheries are the fisheries catching these species in Guinea.
	Ban on fishing species critically threatened with extinction (according to IUCN apud Diop and Dossa, 2011): *Pristis microdon*, *Pristis pectinata*, *Pristis pristis*, *Squatina aculeata*, *Squatina oculata* and *Squatina squatina*.	**Unknown.** The ban in *Pristis* spp would discourage a target fishery for the species. No information available on the types of fisheries catching the species.
Spatial restrictions	Prohibited industrial fishing within the following distances from the coast: - trawling for fish: 10 miles - trawling for cephalopods and shrimps: 12 miles. - longline and gillnet: 6 miles	**Low – Medium:** if adequately enforced the measure could reduce the bycatch of hammerheads in industrial trawling in coastal waters (reproductive habitat for the species).
Gear restrictions	Minimum mesh sizes: - 70 mm for industrial fish and cephalopod trawlers - 50 mm for industrial shrimp trawlers - 30 mm: artisanal demersal gillnets - 25 mm: artisanal pelagic gillnets Prohibited the use of the folling gears: - bottom pair trawling - monofilament nets	**Low.** No expected effect of mesh size regulations on the catches of large size sharks and rays. Restrictions do not affect current fisheries catching sharks.

Management measures	Description	Effectiveness
Bycatch restrictions	Fish can represent a maximum of 30 percent of the catches of shrimp and cephalopods industrial trawlers.	**Low - Medium.** Together with the finning ban, this measure could increase the incentive to release large sharks and rays caught as bycatch in industrial trawlers. The overall significance of industrial catches is unknown.
Product form restrictions	Prohibited finning of sharks before landing. Required 5 percent fin-to-body weight ratio for finned sharks on board vessels involved in tuna fisheries regulated by ICCAT (Recommendation 04-10 2004).	**Low - Medium.** Little effect on artisanal fisheries targeting sharks for meat and fins. Incentive to release individuals caught in industrial fisheries can have some effect, but the overall significance of industrial catches is unknown.
Participatory restrictions	Small-scale fishers required to obtain specific licence for fishing sharks and to pay a licence fee of GNF 5 million (about Eur 7 000/year). Required licence and licence fees for industrial fisheries.	**Low - Medium.** No effectiveness if not accompanied by licence limits. However the specific licenses facilitates future control of fishing capacity. The high licence fees also discourage new entrants to the target fishery. It has for instance contributed to the shift in Ghanaian fishing towards areas where access was more affordable (Diop and Dossa, 2011).
Others	Recommended reduction in fishing mortality on porbeagle until sustainable levels of harvest can be determined through peer reviewed stock assessments (ICCAT Recommendation 07-06) Measure(s) aimed at limiting the fishing capacity (N. Keita, pers. comm.) Adoption of participatory approach to small-scale fisheries management	**No.** Porbeagle not caught in Guinea. **Unknown**. No further details could be obtained. **Medium**. The approach is key for the management of small-scale fisheries, and could lead to the adoption of more effective means for fisheries management and control.

Supporting information

Guinea has a program of fisheries monitoring and biological data collection for the industrial fisheries. Data is collected by field officers at landing point and also by observers on board. Artisanal fisheries are monitored by surveys covering 21 fishing ports for a period of 10 days per month. Therefore the country possesses some means for the continuous monitoring of the shark fisheries. In spite of that, the currently available catch statistics are taxonomically aggregated and do not allow the assessment of trends in the population of the listed species. The lack of priority of sharks in the monitoring program and the lack of capacity of field officers for the identification of shark species could be some of the reasons for the poor quality of the shark catch statistics. Some biological information and parameters for *S. lewini* are available and could provide the basis for the

definition of additional precautionary measures and for the monitoring of population status. As for the other species, no biological information seems to be available. None of the populations of the listed species are assessed in Guinea or elsewhere in West Africa.

Monitoring, Control and Surveillance (MCS) capacity

According to the evaluation N. Keita (pers. comms.), Guinea lacks the means and capacity (human and technical) for the enforcement of the regulations described above. Very little information was available on the characteristics of the MCS system. The industrial sector seems to be reasonably covered by logbooks, observers on board, and port/sea inspection (Annex 4). Ordinance N° 0602/95/MPA/CAB of 31/01/1995 establishes for instance that industrial vessels are required to land their catches in Guinean ports (transhipment only allowed with previous authorization from national authorities) and also to carry observers on board. An evaluation conducted by MRAG (2005) indicated that national enforcement agency had six coastal stations (with 8-10 staff each), that the licensed vessels were reasonably covered by an observer system and that there were five patrol vessels operating in inshore waters. No VMS was implemented at that time, which limited the capacity to enforce the spatial restrictions in place. The small-scale fisheries seem to be only partially covered by the fisheries monitoring and inspection programme. There are 120 identified landing points along 300 km of coastline and very few of them have appropriate infrastructure (loading dock, ice plant, gas station, etc.). The fishery is regularly monitored only in 21 landing points. Sheridan *et al*. (2012) reported the positive results of a pilot project involving small-scale fishing communities in the surveillance of the coastal waters against the illegal encroachment of industrial vessels. However, the experience was not institutionalized and was discontinued at the end of the project. The level of IUU fishing in the country was considered very high by MRAG (2005), accounting for about half of the total catches of the country. Under the framework of the European Council Regulation (EC) No 1005/2008, trade restrictions were adopted by the EU against Guinea in March 2014 (IP/14/304) for their lack of commitment to tackling illegal fishing. The restrictions were lifted in October 2016 following the adoption of measures to address the deficiencies in their fisheries management systems. Since 2013, a total trade ban under CITES has been in place due to non-compliance with CITES provisions, with urgent measures recommended by the Standing Committee of CITES to address illegal trade issues.

Legal acquisition findings

Legislation

The main legal framework for marine fisheries management is provided by the Law *n°2015/26/AN of 14 September 2015 on the Code of Marine*" repealing the Act L/95/13/CTRN of 15 May 1995, implemented by: decree D/97/017/PRG/SGG, which establishes the fines for violations of the Marine Fisheries Code; arrêté n° 1629/MPA/2009/SGG, on a system for positioning and locating industrial fishing vessels and the requirement to install the instrument on board. Other specific ordinances establish management measures for each type of fisheries, including Ordinance N° 0602/95/MPA/CAB of 31/01/1995 for industrial fisheries and Ordinance N° 00676/MPA/SGG/2006 for the artisanal fisheries. Of particular relevance to sharks, the latter establishes specific licence conditions for the targeted artisanal fisheries for sharks and also adopts a participatory approach for the management of artisanal fisheries. Table 12 summarizes the main measures of relevance to shark fisheries adopted nationally and by ICCAT. National legislation does not meet all the minimum requirements for implementation of CITES (Category 2)[9].

Species identification

Guinean field surveyors and fisheries technicians attended regional training workshops on sharks identification organised by the SRFC, as part of the sub-regional PAN-Requiem (Diop and Dossa, 2011). Therefore some level of technical capacity for identifying species in the catch already exists. However it has not resulted in the improvement of the shark catch statistics (Figure 5). According to Namory Keita (Chef de l'Organe de Gestion de la CITES) (pers. comm.), there are no available field guides for the identification of species in the catches. The recently published Volume II of the FAO Regional Guide on Eastern Central Atlantic, covers the area of interest and it is a good material to improve the capacity of field sampling staff to indentify the sharks and rays

9 CoP17 Doc. 22 Annex 3 (Rev. 1) Status of legislative progress for implementing CITES (updated on 1 September 2016).

species in the catch. Capacity building will be required in the identification of species in the products in trade (fins, meat and possibly manta gill rakers). Whereas easy to use tools for the identification of the fins and gill rakers are becoming available (Annex 5), the identification of the species from the processed meat will require molecular/genetic methods or other tools not available locally.

Traceability

No specific information was available on the system(s) of traceability of fish products in place. Considering that the EU is an important export market for fish products from Guinea, the country has to comply with the catch certification system required for exporting to the EU member countries (as established by Council Regulation (EC) No. 1005/2008). However, the country's compliance with this system has been problematic (see above). As a party to ICCAT, Guinea has also to comply with the catch documentation schemes established for bluefin tuna, bigeye tuna and swordfish. ICCAT's schemes have a limited scope in terms of species coverage and would not apply to sharks. Similar (or simplified) schemes would have to be established by CITES and fisheries authorities for the traceability of shark products traded regionally and also to the Asian markets. Determining the origin of the products from artisanal fisheries will be a difficult challenge, considering the limited capacity for their monitoring (see above). Finally, it is worth noting that Guinea has a past record of exports of seahorses (CITES Appendix II) which indicates some level of capacity and experience in issuing CITES permits for commercially exploited aquatic species.

Institutional collaboration

According to Namory Keita (Chief, CITES Management Authority) (pers. comm.), CITES and fisheries authorities have been working together on issues related to commercially exploited aquatic species, including in the set up of a fishing licence and export taxes (not yet implemented) for shark products and the issuing of CITES permits (according to the CITES trade database, Guinea has exported considerable amounts of seahorses in recent years).

Regional collaboration occurs under the Sub-Regional Fisheries Commission (SRFC) Plan of Action for sharks and involves joint research activities, capacity building, information dissemination and MCS. As a party to ICCAT, Guinea also participates of international efforts mediated by the organization for the management and conservation of sharks. A Shark Working Group has been established by ICCAT. The organization has been trying to assess some of the key shark species caught in tuna fisheries and also has put in place measures to protect some shark species at risk (see Table 12).

Under the Canary Current Large Marine Ecosystem (CCLME) project, executed by FAO and UNEP, Guinea has been working together with other six participating countries (Cape Verde, Guinea Bissau, Mauritania, Morocco, Senegal and Gambia) to address priority transboundary concerns on declining fisheries, associated biodiversity and water quality. Among the issues addressed by the project are the reduction of bycatch in industrial trawling fisheries, the management of transboundary resources and the role of MPAs in the management of multiple natural resources.

Mauritania

SUMMARY INFORMATION ON SHARK FISHERIES AND TRADE

Fisheries play an important role in the economy of Mauritania, contributing to 43 percent of the export revenues and nearly 5 percent of the GDP (Diop and Dossa, 2011). Mauritania has the largest industrial fleet in the SRFC area (323 vessels, including chartered vessels) and the third largest artisanal fleet (4 800 canoes, 97 percent of them motorized). Sharks are caught by a fraction of the artisanal fleet and also as bycatch in industrial fisheries. It is estimated that 500 vessels are targeting sharks and rays in Mauritania. The fishery generates 1 800 direct jobs and around 400 jobs in the processing sector (Diop and Dossa, 2011). The principal landing sites are located in Nouadhibou (Boutiya) and Nouakchott, with temporary camps between the Banc d'Arguin National Park (PNBA) and Nouakchott. A specialised shark fishery developed in the PNBA until 2003, but its activities were almost completely stopped in 2004. Of the 30 species of elasmobranchs occurring in coastal waters, three dominate the cacthes: the smooth-hound shark *Mustelus mustelus*, milk shark *Rhizoprionodon acutus* and blackchin guitarfish *Rhinobatus cemiculus*. Of the listed species, hammerheads are frequently observed in the catches. The main fishing gears used in the small-scale sector are fixed gill nets (50 to 150 m long, chute drop between 25 and 35 meshes and mesh size between 140 and 160 mm), thoker (or ray) nets (mesh zize up to 500 mm, vertical drop 5 to 6 meshes) and guitarfish lines. The small-scale fishery involves fishers from Mauritania and Senegal (some vessels from Senegal operate under bilateral agreement between Senegal and Mauritania, others operate illegally). The processing and marketing involve Malians living in Nouadhibou and the Ghanaians in Nouakchott who buy the fish from fishermen and process them before selling them to Ghanaian wholesale fish merchants, who export the finished products to Ghana (Diop and Dossa 2011). To ensure exclusive rights to purchase shark fins, merchants finance the acquisition of fishing equipment, the construction of housing and the provision of food and water to fishing communities along the coast (Diop and Dossa, 2011). There is no information on the types of industrial fisheries catching sharks - the largest industrial fleet are bottom trawlers and involve both national vessels and foreign vessels under access agreement with Mauritania (FAO Fishery Country Profile, 2006). According to Diop and Dossa (2011), most of the bycatch of large sized sharks and rays in West Africa originates from fish and shrimp trawlers. Also according to the authors, Mauritania is the country in the SRFC region with the highest volume of shark bycatch in industrial fisheries. The catches reported to FAO show two periods of high catches, from 1970 to the late 1980s and from 2004 to 2011 (Figure 8). From 2013 the catches reported showed again an increase reaching the value of 4272 tonnes in 2015, representing 1.2 percent of the total marine catches of Mauritania. A small portion of it (76 tonnes/year) is made of the scalloped hammerhead shark *S. lewini*. Also noticeable in Figure 7 is the marked improvement in the taxonomic disaggregation of shark catches since 2009. There is no information on the relative importance of artisanal and industrial shark catches. The artisanal fishery is poorly monitored and there are no reliable statistics from the sector.

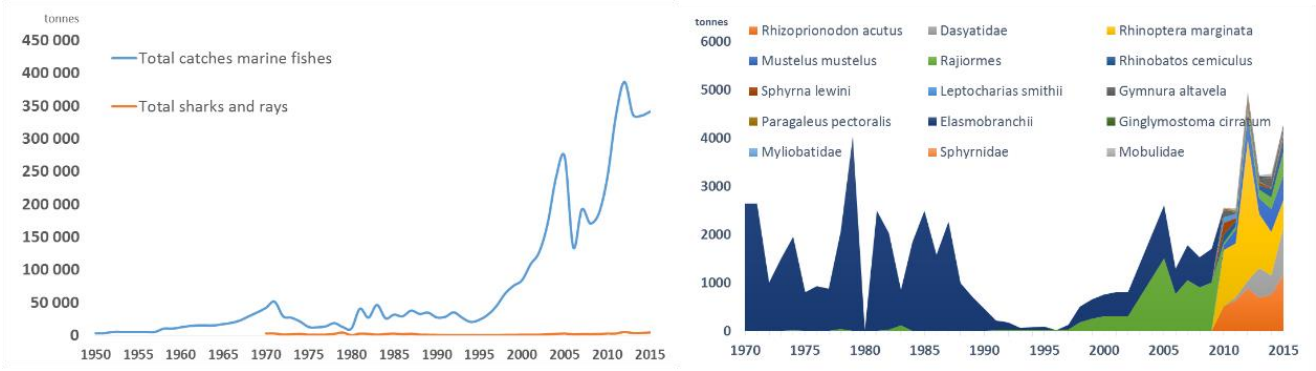

Figure 7. Marine capture fisheries production of Mauritania and the composition of the shark catches in Mauritania (Source: FAO, 2017a).

The high European demand for meat was the driver for exploitation in the early phase of development of the shark fisheries in Mauritania (1960s – 1980s), while the Asian market for fins has been the driving force in the last two decades. It seems therefore that at least three main trade routes coexist in Mauritania: the intra-regional market for meat, the international (mainly European) market for meat and the Asian fin market. The level of

local consumption is unknown (in general fish consumption in Mauritana is very low, in the order of 3,44 kg per person per year, and 90 percent of the total fish production is exported). Most of the shark trade seems to be invisible to authorities, as very small quantities were reported to FAO in recent years (Table 13). In general, the export of frozen products was monopolized by SMCP, a private company controlled by the Ministry of Fisheries. Fresh fish exports are not controlled by this monopoly and are historically undertaken by private sector operators (Megapesca, 2009). We lack more recent information to verify the current situation.

Table 13. Average (2008 – 2013) trade flow of shark products from Mauritania (FAO, 2016c).

Commodity (average 2008-2013)	Export		Import	
	Tonnes	USD'000	Tonnes	USD'000
Sharks nei, frozen	32	131		
Total sharks commodities	**32**	**131**		
Total all marine fisheries commodities	**208 950**	**256 615**	**2 082**	**644**

ASSESSMENT OF NATIONAL CAPACITY TO IMPLEMENT CITES REQUIREMENTS

Non-detriment findings

Management regime

The Act 2000-025 on the Code of Fisheries (amended and supplemented by ordinance 2007-022), the Act 2000-024 (or law of the Banc d'Arguin National Park, PNBA) and the Act on the Code of the marine environment (MEDD) provide the main legal frameworks for marine fisheries management. Mauritania adopted the "Stratégie Nationale de Gestion Responsable pour un Développement Durable des Pêches et de l'Economie Maritime" for the period 2015-2019, aiming at consolidating the achievements and ensuring the coherence of the development of the fisheries sector. No specific management plan exists for the shark fisheries. The PNBA has a management plan as well as a system of co-management of small-scale fisheries that has resulted in specific regulatory measures for shark fisheries in the Park area (Table 15). The NPOA-Sharks was adopted in 2007 (Order No. 2950 / PM of 30 November 2007), and focuses on four main objectives: i) reducing the threats and risks of biodiversity loss; ii) developing an efficient system to meet the needs of research and fisheries management information; iii) establishing appropriate regulatory conservation measures in the context of a precautionary approach; and iv) strengthening the capacity of resource management in general, and of elasmobranchs in particular, through the training of scientists and managers. Mauritania is a party to the following Regional Fisheries Bodies: CECAF, COMHAFAT-ATLAFCO, ICCAT and the SRFC. Of these, ICCAT is the only that adopted specific management measures for sharks. SRFC on the other hand adopted a Sub-Regional Plan of Action for Sharks in 2001 (PSRA-Requins) that has been instrumental to awareness raising and the development of capacity of Member States on shark conservation and management, leading for instance to the adoption of Mauritania NPOA-Sharks in 2007. The country has not ratified the FAO Port States Agreement (but did the accession to it on 23 January 2017) and has not developed an NPOA-IUU. Table 14 summarizes the main management measures currently in place for fisheries catching sharks and assesses their effectiveness in addressing known sources of fisheries mortality on the listed species. In order to improve the regulatory framework for sharks the government is currently considering the adoption of additional management measures, such as the definition of minimum catch sizes for sharks and rays, the definition of bycatch rates for the fisheries catching sharks and rays and the implementation of taxes on the export of shark products [Lamine Camara (Chef Service Environement, Ministère de l'Environnement et du Développement Durable), pers. comm.].

Table 14. Management measures of relevance to shark fisheries in Mauritania. The effectiveness of these measures in addressing the known sources of mortality is noted.

Management measures	Description	Effectiveness
Species prohibitions	Prohibited catch and trade of thresher sharks of the species *A. superciliosus*, oceanic whitetip sharks, hammerhead sharks (except for *S. tiburo*) and silky shark in tuna fisheries regulated by ICCAT. Developing coastal states are exempted from the prohibition to catch hammerheads for local consumption. Those exempted are required to report catch data at least at the genus level, to avoid increase in hammerhead catches and ensure that hammerheads of the family Sphyrnidae (except of *Sphyrna tiburo*) will not enter international trade (ICCAT Recommendation 09-07 2009, 10-07 2010, 10-08 2010, 11-08 2011). Moreover, porbeagle should be promptly released unharmed, to the extent practicable (ICCAT Recommendation 13-10 2013). Ban on tuna purse seiners and longline surface boats fishing for: basking shark (*Cetorhinus maximus*); great white shark (*C. carcharias*); sand tiger shark (*Carcharias taurus*), and tope shark (*Galeorhinus galeus*). Prohibited fishing large sharks and required release of live individuals accidentally caught, including hammerhead sharks and nurse sharks.	**Unknown**. The importance of shark catches in Mauritanian tuna fisheries regulated by ICCAT is unknown. **Medium-high**: In practice protects hammerheads from being a target of the small-scale fishery. Live release of individuals could decrease fishing mortality.
Spatial restrictions	Ban of shark fishing in the Banc d'Arguin National Park (PNBA) since 2003 (except houndsharks *Mustelus mustelus* and *Leptocharias smithi*). Prohibited trawling in areas with less than 20 m depth.	**Low - Medium.** Measure is effective for controlling the targeted fishery in the PNBA area. However, the area under protection is small compared to the overall distribution area of the shark resources (total area of the park is 12 000 km^2, including terrestrial and marine areas). Intense fishing pressure in areas just outside the PNBA and low enforcement capacity also offsets conservation benefits. The no-trawling zone in shallow waters can protect hammerhead coastal habitats from industrial trawlers, but is ineffective for artisanal fisheries.
Minimum size	Minimum landing size of 60 cm or houndsharks (*Mustelus mustelus* and *Leptocharias smithi*)	**None.** Measure not directed to the recently listed species.

Management measures	Description	Effectiveness
Gear restrictions	Prohibited use of shark (drift) nets. Minimum mesh size of bottom trawl nets of 70 mm.	**Low.** Low effectiveness in addressing current sources of mortality (mostly from set gillnets and line fishing). Mesh size regulation does not change the selectivity of the gear to hammerheads.
Temporal (effort) restrictions	Fishing of guitarfish allowed from 1 February 1 to 15 April with a maximum of 600 m of net per boat. Fishing for small sharks allowed from 1 February to 15 April with a maximum of 400 m of net per boat. Total biological rest of three months every year.	**Low – Medium.** Although not directed to the listed species, the restriction of time and effort could also benefit species caught as bycatch. The biological rest can not lead to an effective reduction in fishing mortality if effort is intensified during open fishing season (as happened in the PNBA).
Product form restrictions	Prohibited finning of sharks before landing. Required 5 percent fin-to-body weight ratio for finned sharks on board vessels involved in tuna fisheries regulated by ICCAT (Recommendation 04-10 2004).	**Low - Medium.** Little effect on artisanal fisheries targeting sharks for meat and fins. Incentive to release individuals caught in industrial fisheries can have some effect, but the overall significance of industrial catches is unknown.
Participatory restrictions	Required licenses (artisanal and industrial) and the payment of licence fees (foreign fleet)	**Low.** No effectiveness if not accompanied by licence limits. License system for artisanal vessels not implemented.
Others	Co-management of fisheries in the PNBA	**Low - Medium**: Participation of fishing communities of PNBA in the regulation of shark fisheries provides incentives for compliance with the norms. Exporting the model outside the PNBA could increase management effectiveness.

Supporting information

The improvement in the taxonomic disaggregation of shark catch statistics observed in recent years will be key to evaluate future changes in hammerhead catches and infer also changes in abundance using fishery dependent indicators. Nonetheless the overall quality of the shark catch statistics is likely to be poor because of low coverage of artisanal fisheries by the existing monitoring systems (see MCS section below). No biological studies have been carried out on the listed species and none of the parameters needed for the assessment of the status of the populations are currently available. In effect, none of the populations of the listed species is assessed in Mauritania or elsewhere in West Africa.

Monitoring, Control and Surveillance (MCS) capacity

Controls occur at dockside but also at sea, onboard surveillance vessels, or by aerial surveillance using aircrafts. Onshore enforcement of the regulatory measures for the industrial fisheries is facilitated by the fact

that almost all industrial fishing production is offloaded at the industrial port at Nouadhibou in the north. Only 20 percent of the artisanal fisheries production is landed in that port. The remaining production is landed in multiple landing points with difficult access to inspectors. In the southern part of the country and in the Banc d'Arguin area there are no landings ports, catches are landed on shore and transported to the fish market of Nouakchott, which supplies the local market and the international trade. Twelve landing centers, almost all lacking landing facilities, are located in southern villages in regions of difficult access. VMS is operational in the industrial sector and at the time of writing the Department of Fisheries was considering the obligation of coastal fishing vessels to carry also transponders. The VMS is reinforced by the network of coastal radar installed along the Mauritanian coast. Industrial vessels are also required by law to carry observers on board. The monitoring of the industrial fishing activity is also supported by a Fisheries Information System (SIP) fed by different sources of information: industrial fisheries logbooks, licenses and authorizations, licenses under bilateral agreements with Senegal, marketing, catch certificates, survey data, among others. Based on the above it can be concluded that the country has a reasonable capacity to enforce the norms for industrial fisheries. On the other hand, a considerable part of the artisanal shark fisheries is not covered by the MCS system meaning that regulations for these fisheries are in effect poorly enforced (Annex 4). The lack of a fleet registration and the substantial number of landings sites without inspectors are some of the issues that would need to be addressed to allow the verification of compliance. To overcome some of these difficulties the government was considering the adoption of participatory monitoring of small-scale fisheries (Lamine Camara, pers. comm.). Such systems could work well in areas currently under co-management (e.g. PNBA).

Legal acquisition findings

Legislation

As described above, marine fisheries management in Mauritania is regulated by the Act 2000-025 on the Code of Fisheries (amended and supplemented by ordinance 2007-022), the Act 2000-024 (or law of the Banc d'Arguin National Park, PNBA) and the Act on the Code of the marine environment (MEDD). Specific regulations for sharks have been put in place (national and regional through ICCAT) and they are summarized in Table 14. National legislation does not meet the minimum requirements for implementation of CITES (Category 3)[10]. Since 2004 a total trade ban under CITES is in place due to lack of a national implementing legislation.

Species identification

The identification of species in the catches does not seem to represent a challenge to Mauritania, as evidenced by the recent improvement in the taxonomic disaggregation of shark catch statistics. Field surveyors and fisheries technicians attended regional training workshops on sharks identification organised by the SRFC as part of the PAN-Requiem. Capacity building will be required in the identification of species in trade. Hammerhead fins are definitely in international trade, while the meat (not as palatable as of some other species of sharks, such as smooth-hound) is more likely to supply regional markets. Whereas easy to use tools for the identification of the fins are becoming available (Appendix 4), the identification of the species from the processed meat will require molecular/genetic methods or other tools not yet available locally.

Traceability

A study by Megapesca (2009) indicated that there was no requirement for traceability of fishery products within the Mauritanian legislation. This requirement was therefore not applied by the processing sector until recently. Since the entry in force of the Council Regulation (EC) No.1005/2008, to continue exporting to the EU market the country had to put in place a catch certification system to enable the identification of the origin and legality of products in trade. The current level of implementation of this catch certification system is unknown. No similar mechanism exists for the export of shark products to other markets. As a party to ICCAT, Mauritania has to comply with the catch documentation schemes established for bluefin tuna, bigeye tuna and swordfish. This scheme has a limited scope in terms of species coverage and would not apply to sharks. Similar schemes would have to be established by CITES and fisheries authorities for the traceability of shark products in trade. Products from industrial fisheries should be able to be traced to the originating vessel relatively easily

[10] CoP17 Doc. 22 Annex 3 (Rev. 1) Status of legislative progress for implementing CITES (updated on 1 September 2016).

considering the MCS system for the industrial fleet (see MCS section). On the other hand establishing traceability systems for products from artisanal fisheries will be a difficult challenge. Artisanal landings are not well monitored, the system of fleet registration and licensing are deficient, and products are collected from different locations along the coast. In addition, the possibility that catches would be transhipped at sea to industrial vessels, as reported for other fisheries resources harvested by the artisanal fleet (Megapesca, 2009), would make impossible the identification of the origin of the products.

Institutional collaboration

According to the information obtaind in the Casablanca Workshop …,there were no specific mechanisms of interaction/collaboration between the CITES and fisheries management authorities for the implementation of the listings of sharks and rays. According to the information obtained from Mr Mohamed Elbechir (Chef de Service Environement, Ministère de l'Environnement et du Développement Durable), previous interactions seem to have occurred on an ad hoc basis (e.g. during the 15th Conference of the Parties in Doha) and particularly with the Mauritanian Institute for Oceanographic and Fisheries Research (IMROP) on general scientific matters.

Regional collaboration occurs under the Sub-Regional Fisheries Commission (SRFC) Plan of Action for sharks and involves joint research activities, capacity building, information dissemination and MCS. Mauritania also participates in international efforts mediated by ICCAT for the management and conservation of sharks. A Shark Working Group has been established by ICCAT. The organization has been trying to assess some of the key shark species caught in tuna fisheries and also has put in place measures to protect some shark species at risk (see Table 14).

Under the Canary Current Large Marine Ecosystem (CCLME) project, executed by FAO and UNEP, Mauritania has been working together with other six participating countries (Cape Verde, Guinea, Guinea Bissau, Morocco, Senegal and Gambia) to address priority transboundary concerns on declining fisheries, associated biodiversity and water quality. Among the issues addressed by the project are the reduction of bycatch in industrial trawling fisheries, the management of transboundary resources and the role of MPAs in the management of multiple natural resources.

In 2015, Mauritania and the European Union signed a protocol setting out the fishing opportunities and financial contribution provided for in the Fisheries Partnership Agreement between the two for a period of four years.

Namibia

SUMMARY INFORMATION ON SHARK FISHERIES AND TRADE

Shark fisheries started in Namibia in the 19th century driven by the demand for high quality liver oil. The fishery started first around Lüderitz area and then expanded north to Sandwich Harbour (south of Walvis Bay). Very few activities were reported in the 20th century until the 1960s, when trawl and long line (tuna) fisheries started (the tuna pole-and-line fishery only started in mid 1970s). Sharks were caught as bycatch in these fisheries. In 2000, pole-and-line and longline right holders were permitted to target tuna and other large pelagic species including pelagic sharks. Pole-and-line vessels mainly target tuna while longline vessels mainly target swordfish and pelagic sharks (blue shark and shortfin mako being the most important species). Most pole and line and long-line vessels are Namibian flagged, with some chartered vessels from Japan, South Africa and the EU. The pelagic fisheries are mainly concentrated in the Namibian EEZ with noticeable effort also in international waters. Hammerhead and porbeagle sharks are caught as bycatch in these fisheries, but no specific catch data is available. Table 15 reports the landings of the main target species in the recent period. Between 257 and 346 fishers were involved in the industrial pelagic tuna fisheries in recent years. According to FAO data the average catches of hammerheads in recent years was in the order of 15 tonnes per year, whereas blue shark and mako accounted for 96 percent of the catch of sharks (Figure 8). Also according to FAO data sharks and rays account for less than one percent of the total Namibian marine catches.

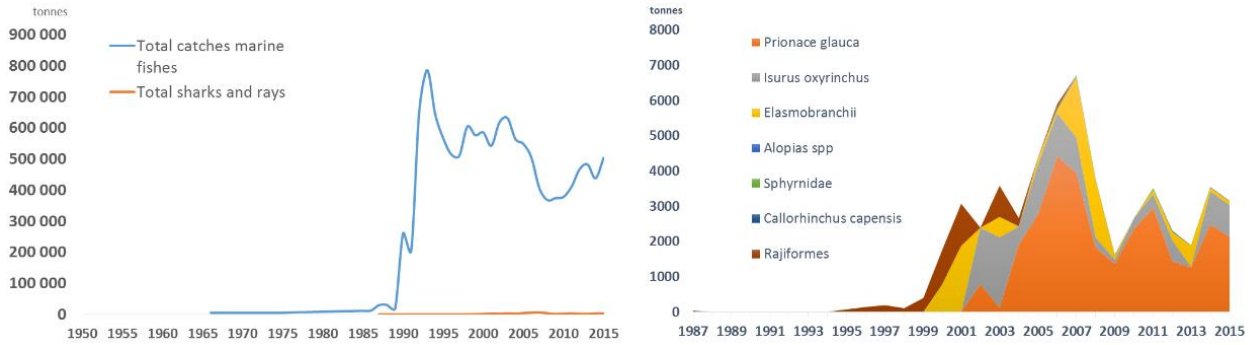

Figure 8. Marine capture fisheries production of Namibia and the composition of the shark catches in Namibia (Source: FAO, 2017a).

Table 15. Landings (tonnes) of ICCAT species by bait boats and long line vessels operating in Namibia during the period 2010 to 2015.

Year	BB	LL	Albacore	Bigeye tuna	Atlantic blue marlin	Skipjack tuna	Swordfish	Yellow fin tuna	Blue shark	Shortfin mako
2010	6	9	1 320	181	23	2	417	9	2 352	307
2011	6	9	3 791	289	10	2	414	90	2 957	377
2012	6	7	2 420	376		15	85	0	1 439	586
2013	3	9	848	135	8	1	129	6	1 147	9
2014	2	11	1 057	240	36		395	15	2 471	950
2015	3	10	1 062	465	8		225	42	2 137	661

Shark catches are mainly for export markets, as local consumption is relatively insignificant. Various shark products are in trade, including meat (fresh, frozen, smoked and dried, salted or for fishmeal), fins (dried) and liver oil. Europe and Asia are the main export markets. Fins are mainly exported to China, Hong Kong SAR, while oil, fillet and trunks are exported to Spain. According to FAO trade data 2 301 tonnes of shark products were exported from 2008 to 2013, valued at about USD 4.5 million (Table 16). Also, according to the reported data, sharks contribute very little to the fish export revenues, accounting to less than 1 percent of the total export of fish commodities in recent years.

Table 16. Average (2008 – 2013) trade flow of shark products from Namibia (FAO, 2016c).

Commodity (average 2008–2013)	Export		Import	
	Tonnes	*USD'000*	*Tonnes*	*USD'000*
Rays and skates (Rajidae), fresh or chilled	7	5		
Rays and skates (Rajidae), frozen	18	89		
Shark fins, dried, whether or not salted, etc.	2	1	1	2
Sharks nei, fresh or chilled	72	103	1	1
Sharks nei, frozen	2 301	4 658	85	210
Total shark commodities	**2 399**	**4 856**	**87**	**213**
Total all marine fisheries commodities	**366 824**	**731 951**	**26 265**	**47 161**

ASSESSMENT OF NATIONAL CAPACITY TO IMPLEMENT CITES REQUIREMENTS

Non-detriment findings

Management regime

The legal framework for fisheries in Namibia is provided by the Marine Resource Act 27 of 2000, amended by the Marine Resources Amendment Act, 2015 (Act 9 of 2015); implemented by the Marine Resources Regulations (G.N. No. 153 of 2001) and the other Regulations relating to the exploitation of marine resources (No. 241 of 2001). A NPOA-Shark was adopted in 2003 but not fully implemented until recently [Titus Iilende, (Deputy Director of Resource Management, Ministry of Fisheries and Marine Resources) pers. comm.]. Namibia is a member of the following Regional Fisheries Bodies: Benguella Current Commission, CCAMLR, COMHAFAT-ATLAFCO, ICCAT, INFOPECHE, Southern African Development Community (SADC) and SEAFO. The country has not ratified the FAO Port States Agreement. An NPOA-IUU has been developed and deposited with FAO. Table 17 summarizes the management measures in place and assesses their effectiveness to address the sustainable use of the listed shark species. Of particular relevance to Namibia are the measures adopted by ICCAT for the protection of hammerhead, oceanic whitetip, thresher and silky sharks caught in association to tuna fisheries. In general the national and regional measures are expected to have a lower effectiveness for porbeagle than for hammerheads.

Table 17. Management measures of relevance to shark fisheries in Namibia. The effectiveness of these measures in addressing the known sources of mortality is noted.

Management measures	**Description**	**Effectiveness**
Species prohibitions	Prohibited catch and trade of thresher sharks of the species *A. superciliosus*, oceanic whitetip sharks, hammerhead sharks (except for *S. tiburo*) and silky shark in tuna fisheries regulated by ICCAT. Developing coastal states are exempted from the prohibition to catch hammerheads for local consumption. Those exempted are required to report catch data at least at the genus level, to avoid increase in hammerhead catches and ensure that hammerheads of the family Sphyrnidae (except of *Sphyrna tiburo*) will not enter international trade (ICCAT Recommendation 09-07 2009, 10-07 2010, 10-08 2010, 11-08 2011). Moreover, porbeagle should be promptly release unharmed, to the extent practicable (ICCAT Recommendation 13-10 2013).	**Medium - High**. All specimens caught in tuna fisheries have to be released. Post-release mortality is uncertain but not expected to be high in longline fisheries (FAO, 2012).
Gear restrictions	Prohibited use of drift nets.	**Low.** Low effectiveness in addressing current sources of mortality (mostly from tuna longline and pole-and-line fisheries).

Management measures	Description	Effectiveness
Catch restrictions	Prohibited discard of any marine resource harvested, or taken as bycatch during harvesting for commercial purposes.	**Low – Medium. M**easure complementary to finning-ban and therefore effective for hammerhead, thresher, whitetip and silky (valued mainly for the fins). sharks. Low effect for porgeable because of the high value of the meat.
Product form restrictions	Required 5 percent fin-to-body weight ratio for finned sharks on board vessels involved in tuna fisheries regulated by ICCAT.	**Low – Medium.** No expected effect for porbeagle, valued for both the fins and the meat. For hammerhead, thresher, whitetip and silky (valued for the fins) sharks, measure complementary to the species prohibition (incentive to release individuals caught).
Participatory restrictions	Required licenses to fish. Effort is also limited by licence restriction.	**Medium.** Although no details were provided on licence restrictions, effort limitation can contribute to limit fishing mortality.

Supporting information

All national and international catches are landed under the supervision of a Namibian Fisheries Inspector as directed by law. Logsheets only make provisions for some shark species, while others such as hammerheads and porbeagle are not reported to the species level. Therefore, current landings' data does not allow the monitoring of trends in the listed populations. No biological data are currently being collected for these species. Namibia participated in the stock assessment of porbeagle and shortfin mako undertaken by ICCAT Standing Committee on Research and Statistics (SCRS). As the species caught in the tuna longline fisheries are widespread and highly migratory, attempts to assess and monitor their status will have to be based on regional collaboration such as the ones supported by ICCAT in the Atlantic. In 2009 ICCAT/SRCS scientists attempted unsuccessfully to assess the southern stock of porbeagle due to insufficient data.

Monitoring, Control and Surveillance (MCS) capacity

Vessels catching the listed species of sharks are well covered by the MCS system (Annex 4). All pelagic fishing vessels are required by law to complete daily logbooks, monthly catch-logsheets and trip management logbooks. All Namibian licensed vessels are required to carry fishery observers on board. At the time of writing, a vessel monitoring system was in force and covered 20 percent of the pelagic fleet (a deadline for installation of vessel tracking devices to all fishing vessels is about to be established). There are only two harbours were landings occur (Luderits and Walvis Bay) and these are overseen by inspectors. There are currently two patrol vessels that undertake surveillance in the EEZ, and they are assisted by aerial surveillance carried out by fixed wing surveillance aircraft. Onshore inspectors are tasked to clear vessel and carry out port inspection and monitoring of landings at all landing sites for both national and international vessels. Inspectors also validate the catch certification schemes currently in use (EU, CCAMLR and ICCAT). Considering the established MCS capacity, no significant difficulties are expected for Namibia establishing a system to verify if the shark products in trade comply with the legal norms. A similar conclusion was reached by an evaluation of the expected impacts of Council Regulation (EC) No.1005/2008, commissioned by the EC (Megapesca, 2009), who concluded that the Namibian MCS capacity would be able to provide a good evidential basis for the validation of landings by Namibian vessels entering international trade. The level of IUU fishing in the country was considered very low (MRAG, 2005).

Legal acquisition findings

Legislation

As described above, the regulatory framework for marine fisheries of Namibia is provided by the Marine Resource Act 27 of 2000 and the Regulations Related to the Exploitation of Marine Resources of 2001. Namibia has also to comply with the shark conservation measures adopted by ICCAT. All the measures of relevance to the listed species are summarized in Table 17. According to the evaluation conducted by the CITES Secretariat[11], the country's legislation meets all the minimum requirements for the implementation of CITES (Category 1).

Species identification

Species identification guides are available and still with the exception of a few species identified in landings' records, shark catch statistics are highly aggregated (Figure 8). The low priority of the listed species (which probably results from their low overall economic importance) and the limited capacity of data collectors and field inspectors seems to contribute to this situation. The identification of species in products in trade is acknowledged as particularly challenging due to the lack of tools and technical capacity. While guides for identifying fins are becoming available (Annex 5), the identification of meat, oil and other processed products will require molecular/genetic techniques that are not currently available in the country.

Traceability

The sharks caught in Namibian longline and pole-and-line fisheries are destined to two main markets: the fins are traded to Asian countries and the meat and oil to European countries. Any exports to the EU would have to comply with the EU catch certification scheme, established by the EC Regulation 1005/2008 as a tool to deter the trade in illegal fish products. Under this scheme a certificate of compliance with the management measures and regulations in place is issued after verification by local inspectors. As the certificate accompanies the landed fish trough trade channels leading to EU markets it provides the needed mechanism for attesting origin and legality of the shark products in trade. No similar mechanism exists for the export of shark products to other markets. In addition to the EU catch certification, Namibia also implements catch documentation schemes established by CCAMLR for toothfish and by ICCAT for bluefin tuna, bigeye tuna and swordfish. These schemes have a limited scope in terms of species coverage and would not apply to sharks. Similar schemes would have to be established by CITES and fisheries authorities for the traceability of shark products in trade. In this regard it is worth noting that Namibia already implements CITES permits to control the trade in Cape fur seals (marine species listed in Appendix II), which requires the involvement of CITES and fisheries authorities. The overall experience of the country with these schemes and permits is expected to facilitate the implementation of traceability mechanisms for the new shark listings. As some of the listed shark species are also caught beyond national jurisdiction by national and chartered vessels, CITES authorities will also have to address the issuing of permits/certificates for fish introduced from the sea. There are no previous experiences in this regard.

Institutional collaboration

The Ministry of Fisheries and Marine Resources (MFMR) is represented in the CITES Scientific Authority Technical Committee established by the Ministry of Environment and Tourism (CITES Management Authority) to assist in the implementation of CITES listings. The MFMR is the nominated Scientific Authority for the marine species. The MFRM has been responsible, for instance, for issuing NDFs for Cape fur seals (CITES Appendix II species). A similar role is expected for the sharks listings.

Namibia participates in international efforts mediated by ICCAT and SEAFO for the management and conservation of sharks. A Shark Working Group has been established by ICCAT. The organization has been trying to assess some of the key shark species caught in tuna fisheries and also has put in place measures to protect some shark species at risk (see Table 17). SEAFO has also put some measures in place to protect the deepwater shark species and is aiming to carry out further research on these sharks. However none of the listed

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sharks species fall within the mandate of the organization, which excludes highly migratory species and species caught within national jurisdictions.

Also in terms of regional collaboration, it is worth noting the participation of Namibia in the Stop Illegal Fishing (SIF) programme of NEPAD's Partnership for African Fisheries (PAF) and also in the Benguella Current Commission. The objective of SIF is to strengthen cooperation and coordination between governments and partners (including IGOs, NGOs, and CSOs) in order to support regional and international processes to stop illegal fishing in African waters. SIF's work focuses on building knowledge and experience of tools, systems and policy requirements to tackle illegal fisheries production and trade (http://www.stopillegalfishing.com). The Benguella Current Commission, established in 2007, has a mandate from Angola, Namibia and South Africa to promote the integrated management, sustainable development and protection of the Benguela Current Large Marine Ecosystem (BCLME). The Commission fosters cooperation among the member countries through science, information sharing and capacity building activities, with a strong focus on the conservation and management of shared fisheries resources (http://www.benguelacc.org).

Nigeria

SUMMARY INFORMATION ON SHARK FISHERIES AND TRADE

Hammerhead sharks are caught mainly as bycatch in industrial trawling fisheries for fish and shrimp. There is no information about catches of the other listed species. FAO Statistics for the country shows a period of high caches in the late 1970s, which was followed by a period of declining production until the mid-1990s (Figure 9). Since then there has been an increasing trend in landings, with the highest catches on record (21 625 tonnes) in 2010 and around 20 000 tonnes in 2015. Statistics are highly aggregated and it is impossible to evaluate the relative importance of the listed species. The average contribution of sharks to total catches between 2006 and 2015 was 5.9 percent.

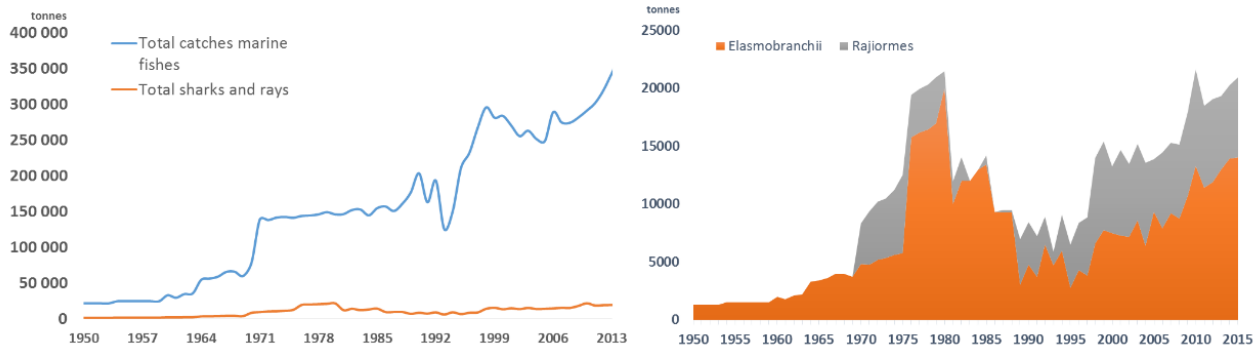

Figure 9. Marine capture fisheries production of Nigeria and composition of the shark catches in Nigeria (Source: FAO, 2017a).

Shark meat is a delicacy to only one percent of the population (consumed fresh and smoked); shark consumption is usually considered a taboo in Nigeria. Therefore most of the production is exported (fins, meat and skin are the main products exported to Asian countries). Sharks have a small contribution to fisheries export earnings and also to the livelihood of fisherfolks (mostly women) involved in the processing of sharks for the local markets. According to A. Cheke (Deputy Director, Federal Department of Fisheries) (pers. comm.) about 5 000 people are involved/benefitting from the capture and post- harvesting activities of these species. About NGN 150 million (ca. USD one million) is being generated from the sales of these species per year. There are no data on the trade volume and value of hammerheads. According to A. Cheke (Deputy Director, Federal Department of Fisheries) (pers. comm.) approximately 100 tonnes of hammerheads are in local and international trade. The available FAO trade statistics for 2008-2013 shows average exports of shark products (shark nei, frozen) of 17 tonnes/year and imports of 528 tonnes per year (Table 18). The importance of the reported trade in sharks compared to the overall exports of marine commodities is negligible.

Table 18. Average (2008 – 2013) trade flow of shark products from Nigeria (FAO, 2016c).

Commodity (average 2008-2013)	Export		Import	
	Tonnes	USD'000	Tonnes	USD'000
Sharks nei, frozen	17	21	528	1 001
Total sharks commodities	17	21	528	1 001
Total marine fisheries commodities	**32 871**	**145 197**	**1 238 679**	**1 201 906**

ASSESSMENT OF NATIONAL CAPACITY TO IMPLEMENT CITES REQUIREMENTS

Non-detriment findings

Management regime

The legal framework for marine fisheries is provided by the Sea Fisheries Act (1992), amended in 2013, the Sea Fisheries and Inland Regulation Act (1992), and the Turtle Excluder Device Act (1992), among others. The Sea Fisheries Act is implemented throught the Sea Fisheries (Licensing) Regulations, Sea Fisheries (Fishing) Regulations and the Sea Fisheries (Fish Inspection and Quality Assurance) Regulations, adopted in 2013. These Regulations, provide among others rules for fishing in marine waters, the landing, the exportation of fish and the issuance of licenses. Nigeria has no specific management plan for shark fisheries and no National Plan of Action for Sharks (NPOA-Sharks). The country has not ratified the FAO Port State Measurements Agreement and has not developed an NPOA-IUU. Nigeria is a member of ICCAT, CECAF, the Regional Convention on Fishery Cooperation among African States Bordering the Atlantic Ocean (ATLAFCO), FCWC, and SCMFMCSGG. Of these RFMOs, ICCAT is the only one that has adopted measures for the conservation of sharks caught in tuna fisheries. Table 19 summarizes the measures currently implemented at the national level (and those expected to be so) and the regional measures adopted by ICCAT, and assesses their expected effectiveness. Considering that hammerheads are mainly caught as bycatch in trawling fisheries, the appropriate implementation of the management measures listed in Table 19 is expected to guarantee some level of control of fishing mortality.

Table 19. Management measures of relevance to shark fisheries in Nigeria. The effectiveness of these measures in addressing the known sources of mortality is noted.

Management measures	Description	Effectiveness
Species prohibitions	Prohibited catch and trade of thresher sharks of the species *A. superciliosus*, oceanic whitetip sharks, hammerhead sharks (except for *S. tiburo*) and silky shark in tuna fisheries regulated by ICCAT. Developing coastal states are exempted from the prohibition to catch hammerheads for local consumption. Those exempted are required to report catch data at least at the genus level, to avoid increase hammerhead catches and ensure that hammerheads will not enter international trade (ICCAT Recommendation 09-07 2009, 10-07 2010, 10-08 2010, 11-08 2011). Moreover, porbeagle should be promptly release unharmed, to the extent practicable (ICCAT Recommendation 13-10 2013).	**Low**. No effect on trawling fisheries.
Spatial restrictions	Fishing 5 nm from the coast is reserved for artisanal boats. No trawling allowed in the zone of 5 nm from the coast.	**Low - Medium.** Protection of shallow coastal waters from trawling can potentially protect essential habitat for hammerheads.
Product form restrictions	Prohibited finning (fins-attached) in the amended Fisheries Act 2011 (yet to be adopted) Required 5 percent fin-to-body weight ratio for finned sharks on board vessels involved in tuna fisheries regulated by ICCAT.	**Low - Medium**. No-finning measure can increase incentive to release sharks incidentally caught as bycatch. Effectiveness depend on post-release mortality.
Catch restrictions	Required landing of a percentage of the shrimp bycatch.	**Low -Medium**. The quota set on the quantity of bycatch in shrimp fisheries, combined with no-finning,

Management measures	Description	Effectiveness
	Total prohibition of discards in the amended Fisheries Act of 2011 (yet to be adopted).	can lead to high grading of the bycatch and thus create an incentive to release sharks. This effect could be offset by the adoption of the discard ban (unless the live release of sharks is allowed)
Gear restrictions	Minimum mesh size of 74 mm in fish trawl nets. Required used of Turtle Excluder Devices (TEDs) and other By-Catch Reduction Devices (BRDs) in trawling fisheries.	**Low-Medium**. Mesh size will have low effectiveness on the selectivity of the net for sharks. Expected positive effect of TEDs on shark escape.
Participatory restrictions	Required licenses for industrial fishing vessels	**Low**. Little effect if not used to limit entry.
Others	Programmes to raise awareness for conservation and management of sharks (Fischer *et al*., 2012)	**Low - Medium**. It can change attitudes towards shark conservation and increase compliance. It does not preclude the need for effective enforcement.

Supporting information

The monitoring of shark catches is very limited. Fisheries inspectors collect fishery data from fishing vessels logbooks, as well as from the monitoring of landings by trawlers at fishing terminals. In both processes, shark catches are grouped together in the statistics, preventing its use in the monitoring of trends of the listed species (Figure 9). According to A. Cheke (Deputy Director, Federal Department of Fisheries) (pers. comm.) sharks have never been a priority for fisheries monitoring and research. As a result there are no available data on basic biological parameters. None of the populations of the listed species is assessed in Nigeria or elsewhere in West Africa.

Monitoring, Control and Surveillance (MCS) capacity

According to Mr Fidelis Odiakaose Omeni (Federal Ministry of Environment) and Ms Abiodun Oritsejemine Cheke (Deputy Director, Federal Department of Fisheries), Nigeria does not have the necessary means and resources for the effective implementation of the management measures listed in Table 19. The lack of a patrol vessel for inspection at sea, the inoperative VMS system, and inadequate human and capital resources are recognized as the main limitations [Annex 4; A. Cheke (Deputy Director, Federal Department of Fisheries) (pers. comm.)]. Fisheries control and enforcement currently relies on limited port inspections and on the submission of logbooks by the fishing companies. Logbooks are considered susceptible to manipulation by fishing companies, and because of that their use in the monitoring of shark catches is considered limited (A. Checke, pers. comm.). Occasional patrols conducted in collaboration with the navy are not exclusively for controlling IUU fishing but also to fight against piracy in general (http://www.stopillegalfishing.com). The lack of patrol vessel is one of the main recognized limitations for the enforcement of trawling fisheries regulations in Nigeria (A. Checke, pers. comm.; Abohweyere *et al*., in press). The main IUU activities of the industrial sector are the under-reporting of catches, illegal transhipment and sales of fish at sea, and the frequent encroachment of trawlers on the 5 nautical mile limit reserved for the artisanal sector (http://www.stopillegalfishing.com). Arrests and prosecution of foreign vessels poaching in Nigerian waters, targeting the high-value shrimps of the delta region, are also reported. The level of IUU fishing is considered very high. According to available estimates, Nigeria loses about 30 million USD annually to IUU fishing by foreign vessels (Falaye, 2008). No updated information was available about current level of IUU catches.

Legal acquisition findings

Legislation

The legal framework for marine fisheries is provided by the Sea Fisheries Act (1992), amended in 2013, Sea Fisheries and Inland Regulation Act (1992), Turtle Excluder Device Act (1992), among others. Of the RFMOs that Nigeria participates, ICCAT is the only one that has adopted measures for the conservation of sharks caught in tuna fisheries, however these are ineffective for the trawling fisheries. Table 19 summarizes the regulatory measures of relevance to sharks. According to the evaluation conducted by the CITES Secretariat[12], the country's legislation meets all the minimum requirements for the implementation of CITES (Category 1).

Species identification

According to the information obtained from Mr Fidelis Odiakaose Omeni (Federal Ministry of Environment) and Ms Abiodun Oritsejemine Cheke (Deputy Director, Federal Department of Fisheries), Nigeria currently lacks the means to identify the shark species in catches and in products in trade. That is consistent with the high level of taxonomic aggregation of shark catches reported in section 2 (Figure 9). Species identification guides are available for the region (see Annex 5) and could eventually be used to produce identification guides for local field inspectors. Manuals and techniques for the identification of fins, which seem to be the main product in trade, will also be required. Some of the resources listed in the Appendix 4 could provide feasible alternatives if accompanied by appropriate training. The identification of species from the processed meat and skin, also reported to be in trade, will be a challenge as noted by FAO (2010; 2012).

Traceability

The export of shrimp, prawns and fishes to the EU is currently covered by a catch certification scheme (as required by EC Regulation 1005/2008). Such scheme is instrumental for determining the origin and legality of the catches in trade. Given the existing capacity in the traceability of fish products from industrial fisheries, it is reasonable to assume that it wouldn't be difficult to develop similar schemes to trace the export of shark products originated from industrial trawlers. The difficulty will rely on verifying the legality of the catches, because of the MCS limitations.

Institutional collaboration

Since 2013, in Nigeria, CITES authorities and fisheries management organizations have never worked together on the implementation of the CITES listings of commercially exploited species (none of the previously listed shark species are caught in Nigerian waters). NSREA and the Federal Department of Fisheries are not yet working together on the implementation of the new shark listings. One proposed option is to designate the Federal Department of Fisheries as the scientific authority for sharks (A. Checke, pers. comm.), but there seemed to be no consensus on the way forward. The status of this collaboration is currently unknown. No attempt has been made by Nigeria to discuss joint arrangements with neighbouring states for the assessment and management of shark fisheries. Of the RFMOs that Nigeria participates, only ICCAT currently implements measures for the conservation of sharks and for the monitoring of catches in tuna fisheries. As a contracting Party, Nigeria is required to report shark catches in tuna fisheries according to ICCAT data reporting requirements, including the discards or releases of oceanic whitetip, hammerhead, thresher and silky sharks. However, based on the information gathered in the present report, the catches of the listed species in tuna fisheries operated in Nigeria are not significant.

Nigeria participates in the Stop Illegal Fishing (SIF) programme of NEPAD's Partnership for African Fisheries (PAF). The objective of SIF is to strengthen cooperation and coordination between governments and partners (including IGOs, NGOs, and CSOs) in order to support regional and international processes to stop illegal fishing in African waters. SIF's work focuses on building knowledge and experience of tools, systems and policy requirements to tackle illegal fisheries production and trade.

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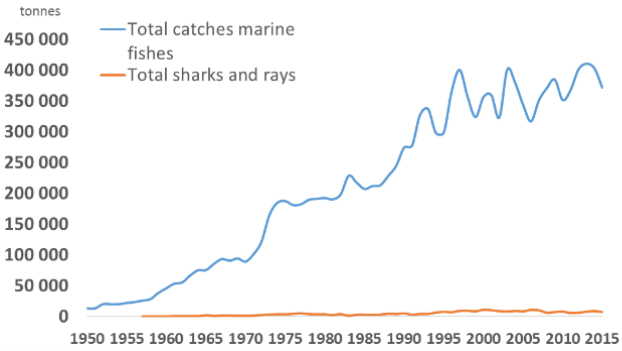
Senegal

SUMMARY INFORMATION ON SHARK FISHERIES AND TRADE

Sharks are caught by small-scale and industrial fisheries (Diop and Dossa, 2011). The bulk of the catches is from incidental takes in small-scale fisheries. Sharks are accessory species in most small-scale fisheries, accounting for the following percentages of catches: 34 percent in driftnet fisheries, 24 percent in purse seine fisheries, 14 percent in fixed gillnets, and 7 percent in gillnets for sole. Senegal also has a target small-scale fishery for sharks, involving 100 fishing units and more than 600 fishers (Diop and Dossa, 2011). The fisheries employ gillnets for guitarfish (*Rhinobatus* spp.) and driftnets (félé-félé). The extent to whichthese fisheries also target the listed species is unknown, but catches are considered likely in this report. Shark catches in small-scale fisheries increased from about 2 000 tonnes in the early 1980s to over 8 000 tonnes/year in recent years. Nevertheless, sharks represent a very low percentage of the total annual landings from the sector, which has been constant at about one percent of the total landings. Sharks are also accessory species in the industrial trawl fisheries for fish, shrimp and cephalopods and in purse seine fisheries for tunas. Shark landings from industrial fisheries have been always less than 1 000 tonnes per year and show a steady downward trend. The species are usually discarded and only those caught at the end of the fishing trip are kept to ensure maximum space on board for the targeted and more valuable resources (shrimp, cephalopods and demersal fish). The practice of finning and the extraction of the liver prior to discarding were reported in the past (Diop and Dossa, 2011). It is currently unknow if these practices remain at the same level. According to national landings statistics, total shark catches reached a peak of 10 102 tonnes in 2006 and have been declining since then. Hammerheads accounted on average to 13 percent of the shark catches from 2002 to 2010. The importance of oceanic whitetip and mantas is unknown but likely to be lower. Mobulids represented 6 percent of the total shark catches in the same period.



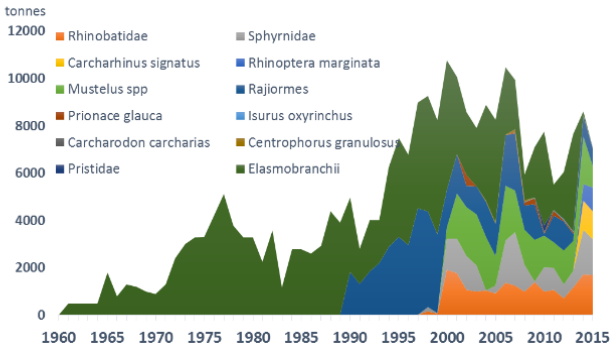


Figure 1

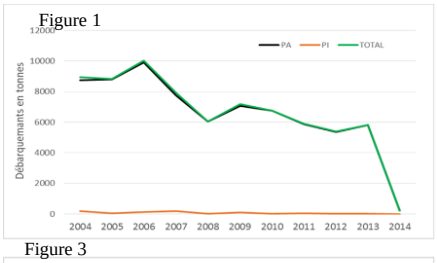


Figure 2

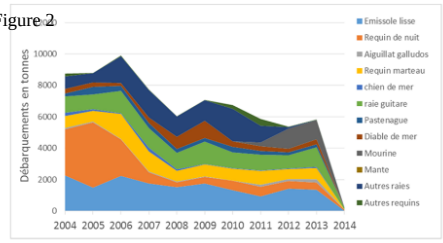


Figure 3

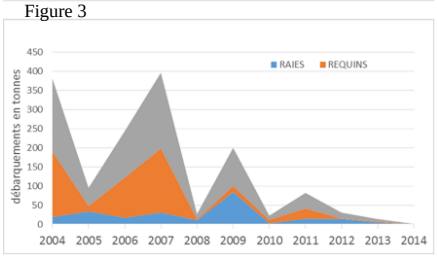


Figure 4

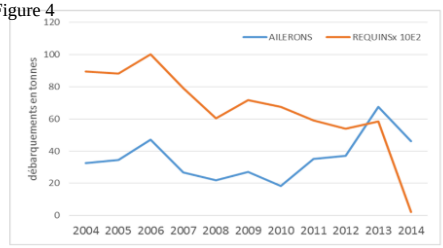


Figure 1: evolution of landings of sharks and rays in Senegal by type of fishing.

Figure 2: development of artisanal fisheries landings by species.

Figure 3: development of industrial fisheries landings by species.

Figure 4: evolution landings of sharks and rays and quantity of fins produced.

Source: Ministry of Fisheries and Maritime Economy of Senegal (2004-2014).

Figure 10. Marine capture fisheries production of Senegal and composition of the shark catches in Senegal [(Source: FAO, 2017a). (2004–2015) and Ministry of Fisheries and Maritime Economy of Senegal (2004–2014)].

According to available estimates, there were 2 180 fishers directly involved in sharks fisheries in the country. The number of people indirectly involved in the processing of the catches varies from 378 (Mamadou Faye, pers. comm.) to over 3 000 (Diop and Dossa, 2011). Actors in the sector seem to be well organised in Economic Interest Groups (GIE) (Diop and Dossa, 2011). The fishery generated a turnover of 1.4 billion FCFA (ca. USD 2.9 million) in 2006. The average commercial value of hammerhead catches from 2002 to 2010 was in the order of 336 000 USD, while the total shark catches was valued at USD 2.9 million. In spite of these numbers, the overall socioeconomic importance of shark fisheries is considered low compared to other marine fisheries resources of Senegal. According to data reported to FAO the catches of sharks represented less than 2 percent of the total national catches of Senegal (Figure 10). There was a considerable improvement in the taxonomic disaggregation of shark catches starting from 1998. An average of 970 tonnes of hammereads is recorded in the period from 2008 to 2013.

The trade in sharks and rays is represented in Figure 11. The shark fishery is financially supported by Ghana's vessel-owners and involves fishers from Ghana and Senegal, particularly in Casamance. The fins are kept by Ghanaian vessel-oweners and exported to Asia through Gambia. The revenue obtained is key for sustaining the fishery. The meat is processed artisanally (salted, dried or smoked). Part of it is exported to Ghana via Gambia, part is exported to central and Eastern African countries and part is consumed locally. Dried shark meat is exchanged for cereals with rural populations and is highly appreciated for its nutritional value and longer shelf life compared to bushmeat (Diop and Dossa, 2011).

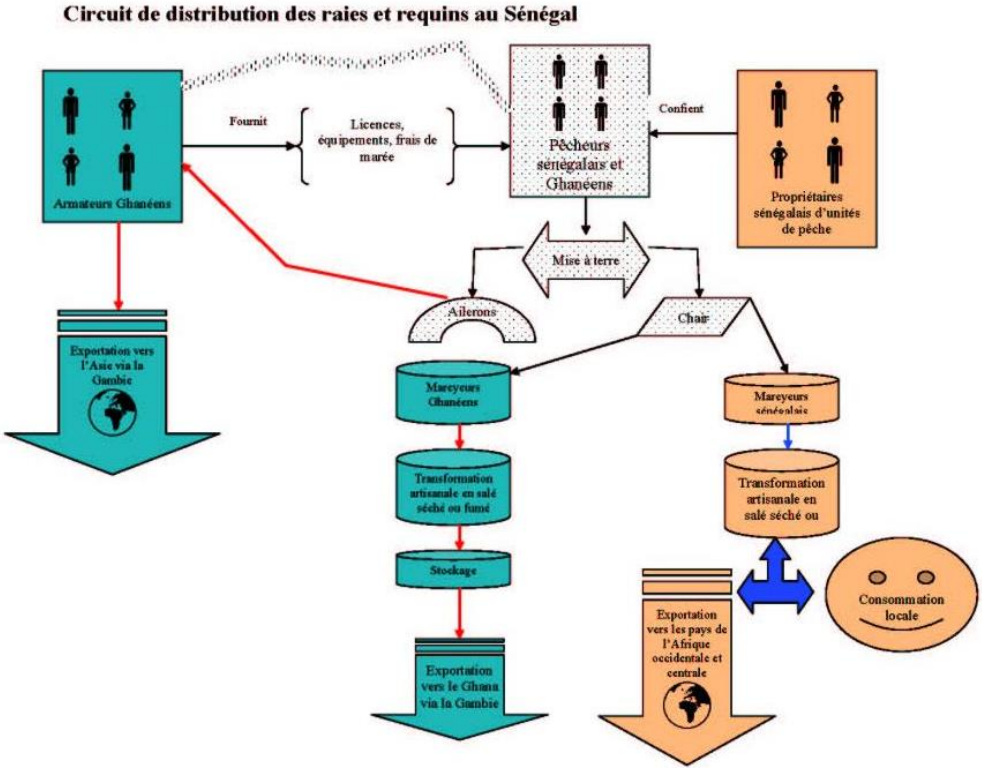


Figure 11. Representation of the trade in sharks and rays from Senegal (source M. Faye, pers. comm.).

The available trade statistics for 2008-2013 shows average annual exports of 64 tonnes of fins and 186 tonnes of meat, valued at USD 2 185 000 per year (Table 20). The reported trade in sharks products is less than 0.5 percent of the total trade in marine capture fisheries commodities in volume and less than one percent in value. There are no specific statistics in trade of listed species, but considering the available catch statistics it is likely that they constitute a small part of the total shark trade. There is no information about the the products of manta rays and mobula in trade.

Table 20. Average (2008 – 2013) trade flow of shark products from Senegal (FAO, 2016c).

Commodity (average 2008–2013)	Export		Import	
	Tonnes	*USD'000*	*Tonnes*	*USD'000*
Shark fins, dried, whether or not salted, etc.	64	1 812	0	0
Sharks nei, frozen	186	371	0	0
Total shark commodities	**250**	**2 185**	**0**	**0**
Total all marine fisheries commodities	**115 292**	**262 458**	**6 722**	**10 265**

ASSESSMENT OF NATIONAL CAPACITY TO IMPLEMENT CITES REQUIREMENTS

Non-detriment findings

Management regime

The law no 2015-18 of 13 July 2015 on the code of marine fisheries and its implementing decrees constitute the legal framework within which marine fisheries operate in Senegal, including shark fisheries. The decree implementing the law n° 2015-18 of 13 July 2015 includes specific measures for the management of shark fisheries (Table 21). A National Plan of Action for the Conservation and Management of Sharks (NPOA) was approved by all stakeholders in the fisheries sector and adopted by the Order No. 006477 of 25 September 2006. The specific objectives of the NPOA are: i) to provide information and technical capacity for the conservation and management of sharks to stakeholders involved in fisheries management; and ii) to promote functional cooperation frameworks to raise awareness among stakeholders and promote appropriate measures for conservation and management. The NPOA implementation is based on five strategic options: i) strengthening the stakeholder's technical and management capacities; ii) promoting consultation among the stakeholders (includes raising public awareness); iii) improving the information on shark resources and fisheries; iv) creating and implementing conservation and management measures; and v) strengthening the sub-regional, regional and international cooperation for shark conservation and management. Senegal is a Member of ICCAT, Cooperating Non-contracting Party to IOTC, Cooperating Non- member to WCPFC and member of Sub-Regional Fisheries Commission (SRFC). The CSRP adopted a Shark Sub-Regional Plan of Action (PSRA-Requins) in 2001 that promotes sub-regional cooperation for the conservation and management of sharks. As a Member of ICCAT, Senegal is required to follow specific measures for sharks caught by national vessels engaged in fisheries regulated by the RFMO (Table 21). The country has not ratified the FAO Port State Measures Agreement and has not developed an NPOA-IUU. Table 21 summarizes the current shark management and conservation measures and assesses their likely effectiveness to address the known sources of mortality.

Table 21. Management measures of relevance to shark fisheries in Senegal. The effectiveness of these measures in addressing the known sources of mortality is noted.

Management measures	Description	Effectiveness
Species-specific prohibitions	*Pristis pristis* and other species of sawfishes. Other species proposed to be protected in the new Code include *Rhynchobatus luebberti*, *Sphyrna mokarran*, *Squatina aculeata*, *Squatina oculata*, and *Squatina squatina* (Fischer *et al*., 2012) Prohibited catch and trade of thresher sharks of the species *A. superciliosus*, oceanic whitetip sharks, hammerhead sharks (except for *S. tiburo*) and silky shark in tuna fisheries regulated by ICCAT. Developing coastal states are exempted from the prohibition to catch hammerheads for local consumption. Those exempted are required to report catch data at least at the genus level, to avoid increase in hammerhead catches and ensure that hammerheads of the family Sphyrnidae (except of *Sphyrna tiburo*) will not enter international trade (ICCAT Recommendation 09-07 2009, 10-07 2010, 10-08 2010, 11-08 2011). Moreover, porbeagle should be promptly release unharmed, to the extent practicable (ICCAT Recommendation 13-10 2013).	**Low.** The compliance with ICCAT's measure would lead to the release of hammerheads, threshers, and whitetip caught in tuna fisheries and a decrease in mortality. However the bulk of the catches (probably originated from incidental takes in artisanal fisheries) would not be affected. Some expected benefit of the proposed prohibition of *S. mokarran*. No effects on manta rays and mobulas.
Spatial restrictions	Prohibited industrial fisheries within 6-7 nautical miles from the coast. Four MPAs, ZPP, marine reserves and community areas (no details provided).	**Low - Medium**. Protection of shallow coastal waters from industrial fisheries could reduce mortality in areas of relevance to hammerheads (no or low effect on the other species). The effect of protected areas is unknown, because no further details on the areas under protection were provided. However, some effect on the artisanal fisheries is expected.
Temporal restrictions	Biological rest period of 2 months per year.	**Low.** To be effective in addressing mortality from industrial fisheries, rest period would need to be adjusted according to critical period for the listed species. Not applicable to artisanal fisheries.
Gear restrictions	Prohibited monofilament, pair trawling and diving. Regulation of the minimum mesh sizes for gillnets for sharks and rays (Decree implementing the law n° 2015-18 of 13 July 2015)	**Low**. Mesh size regulation unlikely to affect shark selectivity in bycatch fishery. Some effect expected from BRDs in reducing the bycatch of

Management measures	Description	Effectiveness
		sharks in trawling fisheries. No effect on artisanal fisheries.
Minimum size	Minimum sizes for blackchin guitarfish (*Rhinobatos cemiculus*, 95 cm) and scalloped hammerhead (*S. lewini*, 145 cm) (Decree implementing the law n° 2015-18 of 13 July 2015).	**Low – Medium.** Effective for *S. lewini*. No effect on other listed species.
Product form restrictions	Prohibited finning of sharks before landing. Required 5 percent fin-to-body weight ratio for finned sharks on board vessels involved in tuna fisheries regulated by ICCAT.	**Low - Medium**. Low effect for small-scale fisheries because of the value of both meat and fins. Some effect for industrial bycatch fisheries. No effect on manta rays and mobulas.
Participatory restrictions	Required licenses for industrial and small-scale (permits) vessels.	**Low**. Low effect, if not used to restrict access.
Limits to fishing capacity	Buyback of fishing vessels. Freezing of licenses for coastal demersal fisheries.	**Low**. Buyback could potentially reduce fishing capacity of industrial fishery. Freeze of licenses puts a cap on fishing capacity. None of the measures would affect the catches of sharks in artisanal fisheries.

Supporting information

The collection of fisheries statistics is carried out by the Direction des Pêches Maritimes (DPM), which annually publishes the overall results of marine fisheries in Senegal. The collection is carried out on a daily basis by field officers in different landing sites. Data on landings, effort and values are compiled by species and then by regional department. Data sent monthly to the DPM is entered in a national database. Not all landing sites of the artisanal fisheries are covered. On the other hand, all industrial landings occur in one port that is monitored. There is not enough accuracy in the data to monitor the abundance of the listed species using fishery-dependent data. Landings' data of sharks and rays is organised in 10 taxonomic categories, including hammerhead sharks and mobulid rays. Oceanic whitetip is grouped together in the category of "other sharks". Biological parameters are generally unknown due to the lack of collection strategy (some data is available for *S. lewini*) (Annex 3). For instance, most individuals are gutted at sea before landing and this complicates the acquisition of biological samples for reproductive and growth studies. None of the populations of the listed species is assessed in Senegal or anywhere in West Africa.

Monitoring, Control and Surveillance (MCS) capacity

Annex 4 summarizes the status of common mechanisms for fisheries monitoring, control and surveillance (MCS) for the industrial and artisanal fisheries catching sharks in Senegal. While the monitoring and enforcement capacity is reasonable good for the industrial fisheries, the artisanal sector lacks most of the MCS tools. Senegal operates a plane for aerial surveillance and 6 patrol vessels, but their activity is constrained by budgetary limitations. The country also operates joint patrols with Mauritania and has 10 shore stations equipped with radios and radar to monitor fishing activities in the inshore zone (Megapesca, 2009). Illegal fishing intensity is thought to be lower than in other countries in the SRFC region, involving both domestic and migrant fishers (Pitcher *et al*., 2006).

Legal acquisition findings

Legislation

As described above, the Law 98-32 of 14 April 1998 on the code of marine fisheries and its implementing decrees constitute the legal framework within which marine fisheries operate in Senegal, including shark fisheries and includes specific measures for the management of shark fisheries. Also, as a Member of ICCAT, Senegal is required to follow specific measures for sharks caught by national vessels engaged in fisheries regulated by the RFMO (Table 21). According to the evaluation conducted by the CITES Secretariat[13], the country's legislation meets all the minimum requirements for the implementation of CITES (Category 1).

Species identification

The monitoring system of shark catch statistics has shown some improvements in recent years, and currently disaggregates catches into 10 different taxonomic groups, including hammerheads and mobulid rays. Despite this improvement, specific data on the listed species is not yet available. Specific identification guides were developed by the SRFC (Annex 5) but seem to have a low usage by field officers [M. Faye (Directorate of Maritime Fisheries, Ministry of Fisheries and Maritime Affairs), pers. comm.]. Field surveyors and fisheries technicians attended regional training workshops on shark identification organised by the SRFC as part of the PAN-Requiem. Manuals and techniques for the identification of fins in trade are becoming available globally and could be used for developing the capacity of customs officers. The identification of species from the processed meat (dried and salted) will be more challenging, as noted by FAO (2010; 2012).

Traceability

The export of fish products from Senegal is controlled by a catch certification system. Any export of fish requires a certificate of first capture (the competent authority is the Direction de la Protection et de la Surveillance des Pêches) and a certificate of origin and health (the competent authority is the Direction des

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Industries et de Transformation des Produits de la Peche). The process starts from the issuance of a certificate of first sale to the establishment of a catch certificate for export. It is unclear if the catch certification in place applies to any exports or just to exports to the EU market (as required by the Council Regulation (EC) 1005/2008 and the EC regulations concerning the certification of sanitary conditions). According to a study by Megapesca (2009), the traceability of landings from industrial vessels is largely in place in Senegal. All landings are inspected on arrival at the port and subject to a health certification at that point, which follows the product until export. The same study also noted that the traceability of products from the artisanal fisheries has been strengthened in recent years. Artisanal landings for exports are restricted to 8 pilot sites, which concentrate about 90 percent of the landings. Each landing of a pirogue is inspected, and a health certificate issued at first sale, which will identify the vessel and which will follow the product until export (Megapesca, 2009). In spite of these improvements in the traceability of products from the artisanal sector, it is doubtful that they would effectively cover the regional trade in shark meat. As was noted by the respondent and also described by Diop and Dossa (2011), artisanal shark fisheries in the region are migratory, operating in different states, and also involve informal trade routes controlled by Ghanaians vessel owners (Figure 11). Although no specific information is provided, it is likely that a considerable part of the trade in sharks from artisanal fisheries is invisible to the system of certification of products in trade. If the current MCS limitations for artisanal fisheries are addressed, the existing catch certification system could provide the basis for the traceability mechanisms required for the CITES legal acquisition findings. As a party to ICCAT, Senegal has also to comply with the catch documentation schemes adopted by the organization for the tunas and swordfish. However these schemes would not apply for sharks caught in the tuna fisheries.

Institutional collaboration

Intense collaboration among agencies occurred within the framework of the implementation of the NPOA-Sharks (M. Faye, pers. comm.). Although no information could be obtained on the ongoing arrangements for the implementation of the new CITES listings of sharks, the previous experience leading to the NPOA-shark is considered positive and opens the precedent for future collaboration on CITES implementation.

Regional collaboration occurs under the Sub-Regional Fisheries Commission (SRFC) Plan of Action for sharks and involves joint research activities, capacity building, information dissemination and MCS. As a party to ICCAT, Senegal also participates in international efforts mediated by the organization for the management and conservation of sharks. It is also worth noting the participation of the country in the Canary Current Large Marine Ecosystem (CCLME) project, executed by FAO and UNEP, which aims to address priority transboundary concerns, inclduing declining fisheries, associated biodiversity and water quality, by fostering the collaboration among the participating countries (Cape Verde, Gambia, Guinea Bissau, Mauritania, Morocco and Senegal).

In 2014 Senegal and the European Union signed a protocol on the implementation of the Sustainable Fisheries Partnership Agreement. This Protocol specifies the fishing opportunities that are granted to European Union fishing vessels, covering both highly migratory species and deep-sea demersal species.

ASIA

China

SUMMARY INFORMATION ON FISHERIES AND TRADE IN LISTED SHARK SPECIES

The listed species are not targeted by commercial fisheries. They are caught as bycatch in small-scale and industrial fisheries for hairtail, pomphret, yellow croaker and tuna, in bottom trawl, drift gillnet, fixed stow net and longline fisheries. The species are caught in international waters of the Pacific and Indian Ocean in tuna longline fisheries. According to national data, total shark catches fluctuated around 7 000 tonnes per year between the 1950s and 1980s and increased slightly since then due to expanding fishing areas and effort. Catches in recent years are about 10 000–15 000 tonnes/year (10 percent in Yellow Sea and Bohai Sea; 40 percent in East China Sea; 50 percent in South China Sea). The national data contrasts with the data reported to FAO, which shows smaller catch volumes (ca. 2 500 tonnes/year in recent years), made almost exclusively of oceanic species caught probably in association to tuna fisheries (Figure 12). Overall sharks and rays represent less than 0.1 percent of the total marine catches of China.

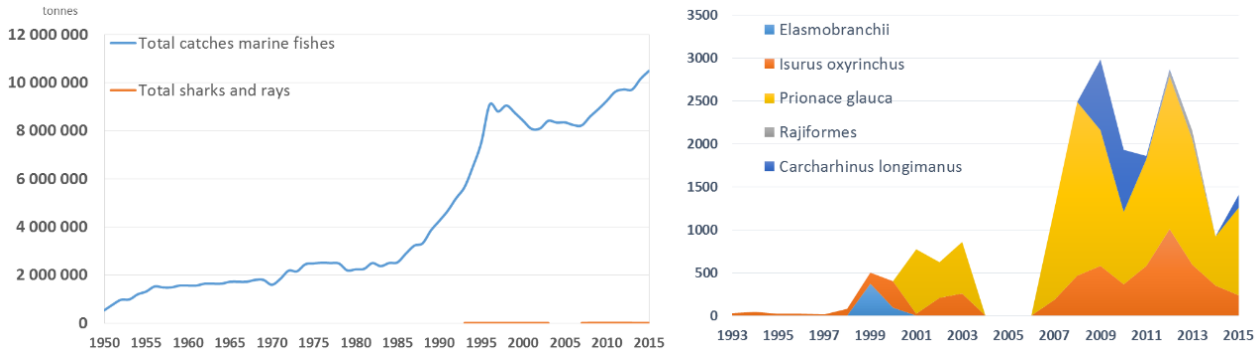

Figure 12. Marine capture fisheries production and the composition of the shark catches of China (Source: FAO, 2017a).

Sharks are fully utilized. Typically the following products are consumed domestically and/or exported: fins, meat, skin, oil, shark cartilage, intensive processing cartilage, viscera, dried small fish, , dried ray, dried gills and salted fish meat. Major domestic markets are concentrated in Guangdong, Fujian and Zhejiang provinces, as well as in mega cities such as Beijing, Shanghai and Guangzhou.

Three major supply chains are recognized:

- Chinese vessels > coastal processing factories > frozen/smoked meat/cartilage > local meat consumption areas and export to developed countries
- Chinese vessels > fins and other by-products > local processing and consumption (Guangdong, Fujian and Zhejiang) and export to overseas Chinese communities.
- Foreign vessels (Spain, Indonesia, Taiwan Province of China, etc.) > fins and other by-products > China, Hong Kong SAR > mainland China for processing > domestic consumption & re-export (via China, Hong Kong SAR) to overseas Chinese communities.

Catches are partially consumed locally and partially exported (e.g. to East Asia, Uruguay, Singapore). Dried or fresh fins are imported mainly from Southeast Asian countries, Spain, and Japan. Frozen whole body of sharks are imported from Uruguay, Spain, Southeast Asian countries, among others. The shark processing industry plays a significant role in local economic development and labor employment. It is estimated that the total output of the processing industry is about 20 000 tonnes per year (of which the listed species constitute an estimated 5 percent).

FAO trade data (Table 22) shows that China is a net importer of shark products, with an average import volume of 5 472 tonnes per year, valued at USD 14 million (representing about 0.22 percent of the total imported value of marine commodities). China is also important as an exporter, exporting an average of 2 337 tonnes (USD

27.1 million) of shark commodities from 2008 to 2013. The characterizing trend, from 2000 to 2012, was the steady and substantial decline of China's trade in shark fins as reported in official statistics. However, the extent to which this represents a real decline, rather than a shift in the composition of China's shark fin trade towards frozen fins that are not reported as such, is unclear (Dent and Clarke, 2015).

According to China, China, Hong Kong SAR CITES Authorities, data since 2013 on shark fin trade from the region indicates imports of fins in the order of 5 500 and 10 000 tonnes per year and re-exports in the order of 2 400 and 5 500 tonnes per year; the trade in the five species listed in 2013 represents between 10 percent and 15 percent of the total shark fin trade in China, Hong Kong SAR.

Table 22. Average (2008 – 2013) trade flow of shark products from China (FAO (2016c) Includes data from China, Hong Kong SAR and China, Macao SAR).

Commodity (average 2008-2013)	Export		Import	
	Tonnes	USD'000	Tonnes	USD'000
Rays and skates (Rajidae), fresh or chilled	162	1 014	0	1
Rays and skates (Rajidae), frozen	24	95	362	345
Shark fins, dried, whether or not salted, etc.	288	8 114	532	3 021
Shark fins, prepared or preserved	90	2 279	8	194
Sharks nei, fresh or chilled	0	0	2	3
Sharks nei, frozen	1 774	15 636	4 569	11 249
Total sharks commodities	**2 337**	**27 138**	**5 472**	**14 812**
Total all marine fisheries commodities	**3 514 717**	**14 948 255**	**3 983 470**	**6 759 385**

ASSESSMENT OF NATIONAL CAPACITY TO IMPLEMENT CITES REQUIREMENTS

Non-detriment findings

Management regime

The harvesting of fisheries resources, including sharks, is regulated in accordance to the "Fisheries Law" and "Provisions on the Administration of Fishery Licensing". The use of shark species listed in CITES appendix II and III is regulated also in accordance to the"Law of Wildlife Protection" and the"Measures for Special Licenses for Exploitation of Aquatic Wild Animals" (2013 Revision), and require a special permission or licence from the competent authorities to be fished, bred in captivity, transported and utilized. The country has not yet developed an NPOA-Sharks and has not ratified the FAO Port States Agreement. China is a member of the following RFBs in the Indo-Pacific region: APFIC, IATTC, IOTC, SPRFMO and WCPFC. China is also a member of ICCAT (Atlantic Ocean). The management measures of relevance to the regulation of shark fisheries are summarized in Table 23.

Table 23. Management measures of relevance to shark fisheries in China. The effectiveness of these measures in addressing the known sources of mortality is noted.

Management measures	Description	Effectiveness
Species prohibitions	China is a member of ICCAT, IOTC, WCPFC, CCAMLR, IATTC, SPRFMO and NPFC. Therefore, Chinese vessels observe the reservation and management measures for sharks of these organizations during their pelagic fisheries activities, such as regulations specific for hammerhead sharks (*Sphyrna* spp.), oceanic whitetip shark (*Carcharhinus longimanus)*, thresher sharks (*Alopias* spp.) and silky sharks (*Carcharhinus falciformis*).	**Low – Medium**: Non retention policy can lead to reduction of mortality between 30 and 60 percent (SPC). Measures with no effect on manta rays and on hammerheads in the Indo-Pacific.
Temporal restrictions	To preserve the fisheries resources, China had implemented the Summer Fishing Closure Season since 1995. According to the Fishery Law, several closed periods in specific areas of the Yellow Sea, Bohai Sea, East China Sea and South China Sea are defined in the Summer period. Specific closed periods are determined by the local fisheries departments for the use of set nets.	**Low – Medium**: Can have some beneficial effect if closed season coincides with mating and parturition periods of the listed species.
Gear restrictions	"The Announcement of Implementing the Minimum Mesh Size System for Permitted Fishing Gear and Interim Fishing Gear" (Effective since 1 June 2014). "The Announcement of Forbidden on 13 Gears Includes Double Monolithic Polycystic Dredge Ship by MOA" (Effective since 1st Jan.2014).	**Unknown:** No details provided.
Product form restrictions	Prohibited finning of sharks before landing and weight-to-body no more than 5 percent regulation.	**Low - Medium.** Little effect on multi-species small-scale fisheries because of the full utilization of shark catches. Incentive to release individuals caught in industrial tuna fisheries can have some effect, but the overall significance of industrial catches is unknown.
Participatory restrictions	Department of fishery administration under the state council was in charge of the approval of fishing licence with marine large trawls, purse seine fishing activities and fishing activities in co-management water and international water. Other fishing licenses were approved by fishery authorities above the county level.	**Low**. Licensing has a low effectiveness if not used to limit access.
Capacity control	Control of the total number of vessels and total horse power.	**Unknown:** no details provided.

Supporting information

According to information obtained during the consultation in Xiamen, China (FAO, 2014b), until now no specific shark species were required to be reported due to the large number of shark species landed and the small relative proportion of sharks in the total catches (Figure 12). In fact, shark catch data reported to FAO only includes the catches from the fisheries' areas under the competence of the RFMOs, not including the Major Fishing Area 51 "Pacific, Northwest". Therefore, the official statistics for sharks include only three oceanic species (shortfin mako, blue shark and oceanic whitetip sharks), while according to national survey data, there are 31 common species of sharks in East China Sea and Yellow Sea, 21 common species in the north part of South China Sea and 12 common species in reef waters off the coast of South China Sea.

As sharks have not been a common target species in China, the fisheries authority has never implemented a specific resource assessment program on sharks. Some biological parameters are available for *S. lewini* in Chinese waters (Annex 3). No biological information is available for the other hammerhead species and manta rays. For oceanic whitetip, life history parameters have been estimated for the western Pacific (Seki *et al*., 1998) and a stock assessment was carried out for the western central Pacific (Rice and Harley, 2012). The evaluation of abundance trends has been also possible in other oceanic areas (Eastern Pacific, Atlantic and Indian Ocean) thanks to bycatch data collected by tuna RFMOs (FAO, 2013). Parties to the IOTC are currently being required to propose a research plan for a comprehensive assessment of priority shark species caught in association to the tuna fisheries, including oceanic whitetip.

Monitoring, Control and Surveillance (MCS) capacity

The large number of vessels (more than 280 000), the limited number of fisheries management staff, law enforcing equipment and funds, and the limited infrastructure of fishing ports, makes it difficult to effectively implement the management measures listed in Table 23. The situation is more critical for the domestic vessels, which constitute the bulk of the fishing fleet catching sharks. According to the information provided in the consultation in Xiamen, China (FAO, 2014b), the domestic fleet is not currently covered by most of the basic MCS tools described in Annex 4.

Legal acquisition findings

Legislation

As noted before, the harvesting and trade in listed species of sharks from mainland China are regulated in accordance to related articles of the "Fisheries Law", the "Provisions on the Administration of Fishery Licensing", the "Law of Wildlife Protection" and the"Measures for Special Licenses for Exploitation of Aquatic Wild Animals" (2013 Revision). The latter regulates the use of species listed in CITES appendix II and III as state protected species (category II). Their utilization must be carried out within the framework of a permission system which requires the operator to obtain permission or licence from the competent authorities while fishing, taming and breeding, transporting and utilizing the species. Table 23 lists all the specific regulatory measures that fishers need to comply with in order to legally export shark specimens and products. According to the evaluation conducted by the CITES Secretariat[14], the country's legislation meets all the minimum requirements for the implementation of CITES (Category 1).

For all forms of international trade in aquatic species, including Introduction from the Sea (IFS), the written approval of the trade by the Fishery Department of the Ministry of Agriculture is the pre-condition for applying for a permit/certificate from the Management Authority of China. For currently listed shark species (Appendix II), if for export or for Introduction from the Sea, a Non-Detriment Finding procedure should be followed, with the Scientific Authority (SA) making the assessment of the export case.

China, Hong Kong SAR Special Administrative Region (HKSAR) implements CITES through its domestic legislation, the Protection of Endangered Species of Animals and Plants Ordinance, which fully complies with CITES provisions. The Ordinance stipulates that the international trade in CITES listed species shall be

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conducted under a permit system in accordance with CITES and the consignments shall be inspected by authorized officers upon import or export/re-export.

Species identification

According to information provided during the consultation in Xiamen, China (FAO, 2014b), there is ongoing work on the production of identification posters to help fishers and observers identify and record the species, as well as on the use of DNA techniques to study offshore stocks and shark products in trade (Annex 5 presents examples of available identification tools for specimens and some of the known products in trade). It should be noted however that the catch statistics currently do not record the listed species at the species level (the only exceptions are shortfin mako, blue shark and oceanic whitetip sharks). Regarding the identification of species in the products in trade, customs officers from China, Hong Kong SAR rely mainly on visual identification using available identification manuals. The large trade volume, the limited resources and the fact that fins are sorted by size and market categories[15] (rather than by species), are mixed in consignments with fins from different body parts of different species, and that processed fins (for which no guides are currently available) are also traded, are recognized as important constrains for the identification of species by enforcement/customs officers. As noted by China in the consultation, "there are still no simple/ low-cost/ fast identification tools and technology for timely clearance of customs or enforcement".

Traceability

There are no traceability mechanisms (e.g. catch and or trade certification, eco-labelling, chain of custody measures, etc.) in place that could assist in the verification of the origin and legality of shark and ray products along the supply chain. In addition, as noted before, a considerable part of the shark fisheries is not adequately covered by MCS tools that could facilitate the verification of the legality of catches.

Institutional collaboration

There seems to be a well-established inter-agency coordination for the implementation of the listings of aquatic species. Any trade in the listed sharks needs a written approval by the Bureau of Fisheries and Fisheries Law Enforcement (Ministry of Agriculture), certifying that the specimens and products are from legal sources. Such approval is the first step for obtaining an export permit from the CITES Management Authority (an NDF from the CITES Scientific Authority is also required before the export permit is granted). The Bureau plays also a role in CITES enforcement along with other agencies (Customs, Border Control Forces and Market Control Agencies). A cross field liaison group was established in China, Hong Kong SAR among relevant enforcement agencies within the government for the better control of CITES species (FAO, 2009). According to FAO (2009) the concerted effort of this liaison group has contributed to streamlining the exchange of intelligence and effective enforcement operations. The CITES Management Authority of China, Hong Kong SAR, also maintains close communication with the trade in shark fins and marine products to facilitate the implementation of regulations.

No specific bilateral or regional collaboration has been yet pursued by China to regulate the sustainable use and trade in the listed shark species.

[15] Three fin market categories have CITES listed species as predominant taxa: *Liu qiu* (*C. longimanus*), *Chun chi* (*S. zygaena* and *S. lewini*) and *Gu pian* (*S. mokarran*).

India

SUMMARY INFORMATION ON SHARK FISHERIES AND TRADE

Sharks are mainly caught as bycatch in multi-species, small-scale and industrial fisheries, including in trawl, gillnet and longline fisheries. Currently sharks are taken by a combination of different types of vessels and gears. Based on this, Kizhakudan *et al*., 2015 classified the fishery into three major sectors - mechanised (large boats with inboard engines), motorised (boats with outboard motor) and non-motorised. During 1985-2013, the mechanised sector (trawl fishing, offshore large gill net operations and longlining), contributed to the major share (71 percent) of sharks landed, the motorised sector (small scale coastal fishing operations using gill nets) accounted for 22 percent and the non-motorised sector (Hook & line operations, cast nets, small gill nets and traps), 7 percent. It is estimated that between 15 000 and 20 000 fishers are engaged exclusively in shark fishing in India (BOBLME, 2011).

Sharks of the family Carcharhinidae (requiem sharks) formed 84.6 percent of the true sharks landed during 2007-2013; Sphyrnidae (hammer-head sharks), Alopiidae (thresher sharks), Lamnidae (mackerel sharks), Hemiscyllidae (bamboo sharks) and Triakidae (hound sharks) are other major contributors to the commercial fishery. Landings of rays are dominated by species of the families Dasyatidae, Mobulidae, Myliobatidae, Gymnuridae and Rhinopteridae, with Dasyatidae constituting about 75.8 percent of the rays landed during 2007-2013. The guitarfish fishery in India is dominated by members of the family Rhinobatidae. In FAO dataset, all the shark species are recorded as "sharks, rays, skates, nei" (Figure 13). Surveys conducted in the Cochin Fisheries Harbour in the 1980's and 2000s indicated that *S. lewini* is one the main species of sharks being landed (between 11 percent and 27 percent of the shark landings) (Fischer *et al*., 2013). Heinrichs *et al*. (2011) estimates that about 690 manta rays are caught annually in India, placing the country among the top manta fishing nations.

The west coast of India has remained more productive than the east coast, contributing, on an average, 68 percent of the annual landings of true sharks and 66 percent of the annual skate landings in the country. The east coast, on the other hand, has remained the higher contributor of ray landings with annual average contribution of 72 percent (Kizhakudan *et al*., 2015).

The annual landing of sharks in India reported to FAO in 2015 was 52 434 tonnes, constituting 1.9 percent of the total marine fish production in the country. A peak was observed in the year 1996, when it almost reached 132 thousand tonnes, then the trend from 2000 to 2015 has been fluctuating. The Central Marine Fisheries Research Institute reports that sharks constitute 44 percent of total shark landings, rays, 52 percent and skates, 4 percent (CMFRI, 2014)[16] (Figure 14). The increase in shark landings during 1997-2000 is the result of intentional whale shark hunting, in high intensity, along the north-west coast of India (Kizhakudan *et al*., 2015).

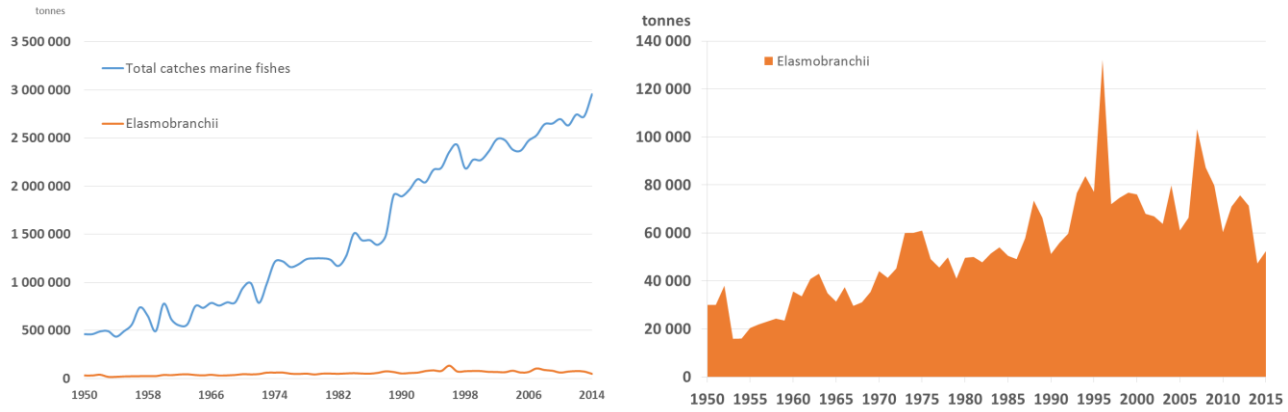

Figure 13. Marine capture fisheries production and the composition of the shark catches of India (Source: FAO, 2017a).

[16] CMFRI. 2014. Annual Report 2013-14. Central Marine Fisheries Research Institute, Cochin, pp. 16.

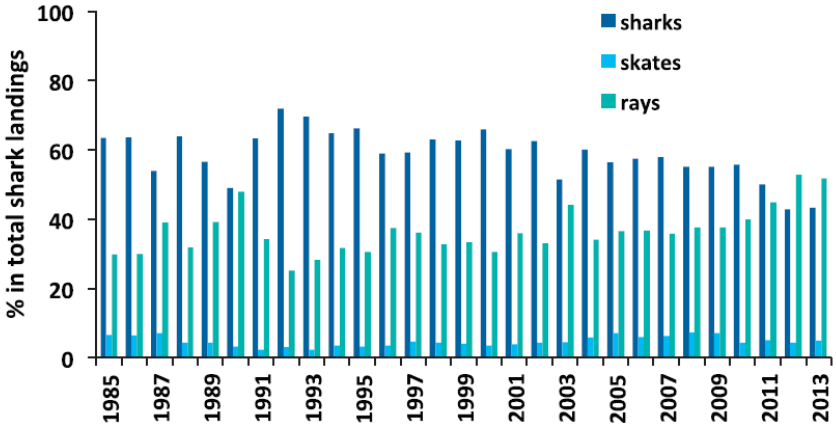

Figure 14. Percentage contribution of sharks, skates and rays to India's shark production as reported by CMFRI (Source Kizhakudan *et al*., 2015).

Sharks are fully used in India. Utilization of sharks in India is mostly in the form of shark meat, with a good domestic market for fresh meat in the coastal states and in dried form in the southern coastal states. Shark meat is salted or sold in fresh condition in the domestic market. The main markets are in the coastal states of Kerala and Tamil Nadu. The shark meat is consumed fresh in many coastal areas, especially by the poor. Salted and dried shark is also popular in certain areas. Shark liver oil is extracted by local methods and used for oiling wooden canoes as well as for pharmaceutical purposes. Shark liver oil is also used in tanning and textile industries. Shark products and by-products exported include dried shark fins, fin rays, shark cartilage, shark liver oil and shark skin. Kizhakudan *et al*. (2015) reports that following the ban on shark finning announced in August 2013, there have been no reports of the practice in any part of the country.

India's export and import statistics for the period 2008-2013 indicates that shark products formed less than 0.1 percent of the total marine fishery exports from the country. Imports were only in the form of shark fillet which was about 0.1 percent of the total marine fishery imports into the country.

As per Marine Products Export Development Authority (MPEDA) statistics, India exported 195 tonnes of shark fins worth 14.99 million USD in 2011 against 960 tonnes worth 2.74 million USD in 1998. The quantum of shark fins exported from India in 2013-14 stood at about 122 tonnes. China, Hong Kong SAR, China and Singapore are the major demand centres for shark fins (MPEDA). According to trade data reported to FAO, the volume of shark fins (frozen) exported from India in recent years was 106 tonnes per year, valued at USD 8.7 million/year (Table 24).

Table 24. Average (2008 – 2013) trade flow of shark products from India (FAO, 2016c).

Commodity (average 2008-2013)	Export		Import	
	Tonnes	USD'000	Tonnes	USD'000
Rays and skates (Rajidae), frozen	4	3		
Shark fillets nei, frozen	77	189	23	11
Shark fillets, fresh or chilled	0	1		
Shark fins, dried, whether or not salted, etc.	3	242		
Shark fins, frozen	106	8 684	0	1
Sharks nei, fresh or chilled	1	1	0	0
Sharks nei, frozen	5	10	0	0
Total sharks commodities	**195**	**9 129**	**24**	**12**
Total all marine fisheries commodities	**804 838**	**2 969 758**	**28 866**	**89 104**

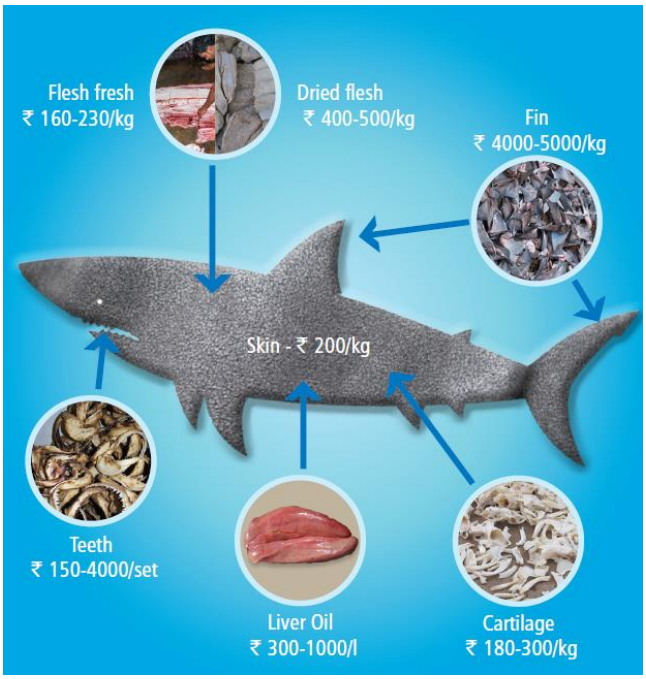

Figure 15. Price structure of shark by-products in India (100 Indian Rupee equals about 1.6 USD) (Source Kizhakudan *et al*., 2015).

ASSESSMENT OF NATIONAL CAPACITY TO IMPLEMENT CITES REQUIREMENTS

Non-detriment findings

Management regime

The political power to enact laws is divided between India's Central Government and the Indian states. The Ministry of Agriculture, Department of Animal Husbandry, Dairying and Fisheries (DADF), is responsible for the fisheries in the EEZ. Relevant legislation includes: the 1897 Fisheries Act, amended by the Gujarat Fisheries Act, 2003 (Act No. 8 of 2003) and repealed by the Repealing and Amendment Act, 2015 (No. 17 of 2015); the 1986 Environment Protection Act; the 1978 Marine Fishing Regulation Act and the 1991 Coastal Regulation Zone Notification. The country developed a comprehensive marine fishing policy on the principle of stakeholder participation (led by an inter-ministerial Empowered Committee). Measures are based on and consist of entry controls and technical measures. In 2015, the Central Marine Fisheries Research Institute has produced a Guidance on National Plan of Action for Sharks in India[17] with the aim to to present an overview of the currents status of India's shark fishery, including the assessment of the management measures and their effectiveness for shark conservation and the identification of the knowledge gaps that need to be addressed to evolve the NPOA-Sharks, thus suggesting a theme-based action plan for the NPOA-Sharks. India's first move towards shark conservation was in 2001 when 10 species of elasmobranchs were included under Schedule I of the Indian Wildlife (Protection) Act, 1972, last amended in 2013. This was the result of extensive whale shark hunting along the north-west coast of India, particularly in Gujarat during the latter half of the 1990 s. In 2013, India went on to promote the "fin-on" policy, i.e. landing of the entire shark (see the Ministry of Environment and Forests (Wildlife Division) policy (2013). Subsequently India supported the trade regulations on species listed under CITES Appendix II in 2014, in fact in February 2015, the Department of Commerce of the Ministry of Commerce, Government of India issued an order prohibiting the export and import of shark fins in India (Kizhakudan *et al*., 2015). India has not signed the Port State Measures Agreement. The country is a member of IOTC, BOBP-IGO, and of CCAMLR. Table 25 summarizes the management measures of relevance to shark fisheries in the country.

[17] Kizhakudan S.J., Zacharia P.U., Thomas S., Vivekanandan E. and Muktha M. 2015. Guidance on National Plan of Action for Sharks in India. CMFRI Marine Fisheries Policy Series No. 2, 104p.

Table 25. Management measures of relevance to shark fisheries in India. The effectiveness of these measures in addressing the known sources of mortality is noted.

Management measures	Description	Effectiveness
Species prohibitions	Protection of the sharks and rays species: *R. typus*, *Anoxypristis cuspidata*, *Carcharhinus hemiodon*, *Glyphis gangeticus*, *Glyphis glyphis*, *Himantura fluviatilis*, *Pristis microdon*, *Pristis zijsron*, *Rhynchobatus djiddensis* and *Urogymnus asperrimus* Schedule 1 of the Indian Wildlife (Protection) Act, 1972. As member of IOTC and CCAMLR, Indian vessels observe the reservation and management measures for sharks of these organizations: i) thresher sharks (*Alopias* spp.) not to be retained and to be released unharmed, to the extent practicable, when caught in association to IOTC regulated fisheries (Resolution IOTC 12/09 2012); ii) oceanic whitetip shark (*C. longimanus*) not to be retained and to be released unharmed, to the extent practicable, when caught in association to IOTC regulated fisheries (Resolution IOTC 13/06 2013); iii) prohibition of setting a purse seine net around a whale shark (*R. typus*), in the IOTC area of competence. (Resolution IOTC 13/05 2015); CCALMR Conservation measure 32-18 (2006) on the conservation of sharks, prohibition of direct fishing and release alive of any bycatch of shark taken accidentally in other fisheries.	**Low – Medium**: Non retention policy for whitetip and threshers can lead to reduction of mortality. Measures with no effect on manta rays and hammerheads.
Spatial restrictions	33 marine Protected areas (MPAs) in India, covering about 6 271 km2.	**Low – Medium:** MPAs of small size can have benefits to sharks if the areas under protection include critical habitats for the species (unknown). Total area under protection covers only a small part of the shelf (1.2 percent) and would have only a minor effect on the fishing mortality of migratory species such as sharks.
Temporal restrictions	Ban on fishing for 47 days from 15 April to 31 May in East coast of India (both days inclusive) and from 15 June to 31 July in West coast of India (both days inclusive).	**Low – Medium**: closed season can have some beneficial effect if coincide with mating and parturition periods of the listed species (unknown).
Product form restrictions	Policy on prohibition of "finning" of shark fins in the sea, prohibit the removal of shark fins on board a vessel in the sea. Ministry of Environment and Forest (Wildlife Division) F. No 4-36/2013 WL, 21 August 2013. Prohibited shark fin export and import by the Department of Commerce, Ministry of Commerce	**Low - Medium.** Little effect on multi-species small-scale fisheries because of the full utilization of shark catches. Incentive to release individuals caught in industrial tuna fisheries can have some effect, but the overall significance of industrial catches is unknown.

Management measures	Description	Effectiveness
	(2015)	
Gear restrictions	Restriction on mesh sizes and on certain seine nets (no details provided).	**Unknown:** no details provided.
Participatory restrictions	Entry controls through licenses.	**Low**. Licensing has a low effectiveness if not used to limit access.

Supporting information

India only reports sharks under the category "Sharks, rays, skates, etc. nei", which hampers the use of global catch data to infer trends in the listed species. However, Fischer *et al*. (2013) noted that a number of exploratory surveys have contributed to the information on shark composition, abundance and behavior in waters around India. For instance, the Fishery Survey of India (FSI) carries out systematic and regular surveys for deeper and oceanic fishery resources in the Indian EEZ, which provides data on species composition, catch, effort and CPUE of oceanic whitetip and hammerheads. Apart from FSI, the Central Marine Fisheries Research Institute (CMFRI) and the Department of Fisheries of the Coastal States/Union Territories collect data regularly based on a scientific sampling methodology on species and landings of shark species (Fischer *et al*., 2013). Despite its relatively low coverage of coastal landings activity (due to shortage of staff), the CMFRI data collection scheme is considered a robust system for obtaining reliable estimates of total catch (Stobberup, in prep.).

Some biological parameters are available for oceanic whitetip and scalloped hammerhead sharks in Indian waters collected by the CMFRI (Annex 3).

Monitoring, Control and Surveillance (MCS) capacity

MCS capacity is generally limited, particularly so for the small-scale sector (Annex 4).

Legal acquisition findings

Legislation

Relevant legislation includes the 1897 Fisheries Act, the 1897 Fisheries Act, amended by the Gujarat Fisheries Act, 2003 (Act No. 8 of 2003) and repeales by the Repealing and Amendment Act, 2015 (No. 17 of 2015); the 1986 Environment Protection Act; the 1978 Marine Fishing Regulation Act and the 1991 Coastal Regulation Zone Notification. In addition ten species of shark are protected under Schedule 1 of the Wildlife (Protection) Act of India (1972). India has adopted technical measures such as temporal and spatial restrictions (Table 25) that have some relevance to the management of shark fisheries. These measures could be used as a basis for legal acquisition findings, if adequate means of verification of compliance verification are in place. Moreover, India promotes the landing of the entire shark under the policy of the Ministry of Environment and Forests (Wildlife Division) 2013, and since February 2015, the export and import of shark fins is prohibited (Department of Commerce of the Ministry of Commerce) (Kizhakudan *et al*., 2015). According to the evaluation conducted by the CITES Secretariat[18], the country's legislation meets all the minimum requirements for the implementation of CITES (Category 1).

Species identification

According to the report of India to FAO, shark identification in the field is poor and taxonomists are lacking (Fischer *et al*., 2013). Regional FAO fish identification tools (including chondrichthyes) are available (Annex 5) and could be used to prepare field guides and other tailor-made visual identification tools for sharks in the

[18] CoP17 Doc. 22 Annex 3 (Rev. 1) Status of legislative progress for implementing CITES (updated on 1 September 2016).

catches. No information could be obtained on the availability of identification tools for the shark products in trade.

Traceability

The country has no mechanism established for verification of the origin and legality of shark and ray products along the supply chain. The fisheries data collection system is based on a sampling of the landings activities which covers between eight and ten percent of the landings. This low coverage, combined with the lack of other means of enforcement for most of the small-scale fisheries, will represent a real challenge to the verification of the legality of shark products in trade.

Institutional collaboration

India has a relatively complex institutional arrangement for fisheries management, involving organizations at the Central Government and the Indian states. The Ministry of Agriculture, Department of Animal Husbandry, Dairying and Fisheries (DADF), is responsible for the fisheries in the EEZ. The Ministry of Environment and Forests and the Wildlife Crime Control Bureau are the CITES Management Authorities. The Central Marine Fisheries Research Institute is one of the recognized CITES Scientific Authorities. According to information obtained during the consultation, permits and controls for international trade in aquatic species listed in CITES Appendices are being established by Marine Product Export development Authority and Export Inspection council, Ministry of Commerce. No information could be obtained on the level of inter-agency collaboration for the implementation of the listings of sharks and manta rays.

CMFRI conducts strategic research programmes to continuously monitor shark fishery along the Indian coast and assimilate shark landing data. The Association of Deep Sea Going Artisanal Fishermen (ADSGAF) has agreed to supplement CMFRI's species-wise catch data with details on fishing areas (Kizhakudan *et al*., 2015).

At the regional level, India is a member of the Bay of Bengal Programme Inter-Governmental Organization (BOBP-IGO) and of the Indian Ocean Tuna Commission (IOTC). A programme has been initiated under the aegis of the BOBP-IGO to formulate a National Action Plan and Regional Action Plan for the conservation and protection of sharks in the member-countries (Bangladesh, India, Maldives, Sri Lanka). As a member of IOTC and CCALMR India is observing regulations adopted by the parties regarding shark fishing, including data reporting and conservation measures (Table 25).

Indonesia

SUMMARY INFORMATION ON SHARK FISHERIES AND TRADE

Shark fisheries have been operating since the 1970s. At the beginning sharks were caught mostly as bycatch in tuna fisheries (longline and gillnet fisheries in the Indian Ocean). The increase in fin price in 1988 led to an increased interest in sharks, which since then became the main source of income in some communities and even a target of commercial fisheries (small-scale longline fishery). Sharks are also caught as bycatch in coastal demersal fisheries, including small-scale fisheries with gillnet and demersal longline. Mantas are mainly caught as bycatch in longline and gillnet fisheries for tunas (takes in recreational scuba diving and snorkelling are also reported). None of the shark and manta ray species listed in Appendix II are specifically targeted in the Indonesian shark fisheries, being a part of multi-species fisheries. Shark production in Indonesia (ca, 110 000 tonnes/year in recent years) only contributes to about 2.5 percent of the total marine fishery production. Dasyatidae contribute about 30 percent to the total shark production, whereas hammerheads (mainly *S. lewini*) contribute to less than 14 percent, while the oceanic whitetip contributes to less than 1 percent. Catches of sharks and rays species historically recorded in highly aggregated categories, since 2005 is reported in more detailed taxonomic groups (Figure 16).

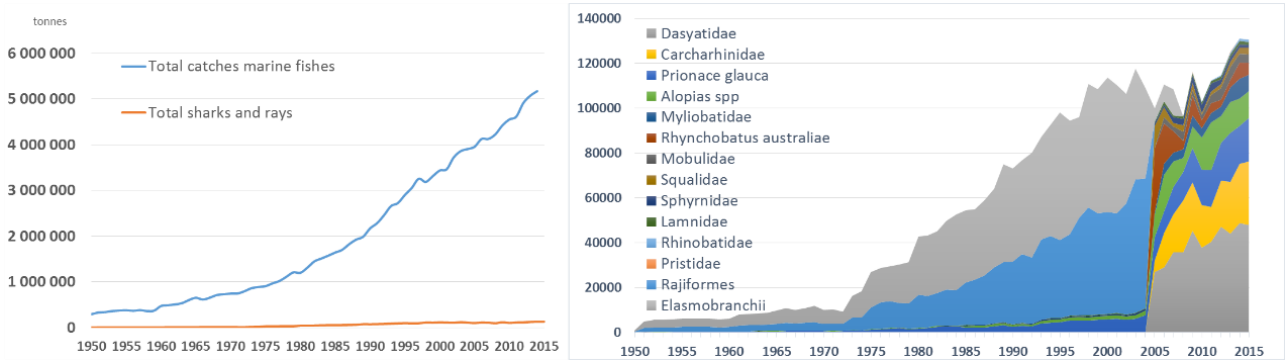

Figure 16. Marine capture fisheries production and the composition of the shark catches of Indonesia (Source: FAO, 2017a).

At least 221 species of sharks and rays have been found in Indonesian waters, which consists of 117 shark species, 3 ghost shark species, and 101 ray species from 44 families (Fahmi, 2010; 2011; Allen & Erdman, 2012). From the 44 cartilaginous fish families, only around 26 shark species from 10 genus and 6 families have high economic value from trade of their fins in national and international market. Sharks from Carcharhinidae, Lamnidae, Alopiidae and Sphyrnidae family are the ones commonly caught for its fins due to its big size. On the other hand, there are several shark-like ray species from Rhynchobatidae, Rhinobatidae, Rhinidae and Pristidae family are caught for its fins. Some even have relatively higher price in the market compared to shark fins[19]. The products of sharks and rays listed in Appendix II CITES have a relatively low importance in the Indonesian shark industry, in terms of volume and value. The number of people involved in shark industry is considered small compared to the total people involved in Indonesian marine fishery. All body parts of hammerhead and whitetip sharks are used. The fins are consumed locally or exported overseas (including to Japan, China, Hong Kong SAR, Singapore, China, Malaysia and Taiwan Province of China). Usually the exported fins are those that have met the market size and usually in a complete set (dorsal, pectoral and lower caudal fins). The meat is salted or smoked, mainly for local consumption, with only a small portion destined for export (including to Singapore, Bangladesh and Sri Lanka). The meat of adult hammerheads is usually salted and traded while that of juveniles is usually traded fresh or in fillet in local markets. Shark skins are usually dried and utilized as food (crackers). The cartilage is generally dried and exported to Japan. Manta ray meat is consumed locally (fresh or salted) or exported (salted) to Sri Lanka and Bangladesh. Other products in trade include gill rakers, skin and jaws. Available shark trade data is reported in Table 26. In the fishery statistics data, only shark fins are specifically recorded, while other parts of the shark or ray body such as soft bone, sin, and gills are clustered together with other shark parts (shark fresh or chilled). Meanwhile, shark oil

[19] National Plan of Action (NPOA) Conservation and Management of Sharks and Rays 2016-2020. Ministry of Marine Affairs and Fisheries – Republic of Indonesia

is put in the same category as other fish oil products and it is therefore very difficult to obtain precise production numbers (Blaber, 2006). The supply chain of shark products in Indonesia is relatively complex. Sharks are purchased from fishers by local collectors before sending to larger collectors and utilization units in large cities (Jakarta, Surabaya, Medan and Denpasar) from where they are exported by air. Shark products are also exported by sea (to Japan) from Makassar and Cilacap.

Table 26. Average (2008 – 2014) trade flow of shark products from Indonesia (FAO, 2016c).

Commodity (average 2008-2013)	Export		Import	
	Tonnes	*USD'000*	*Tonnes*	*USD'000*
Rays and skates (Rajidae), fresh or chilled	322	397		
Rays and skates (Rajidae), frozen	15	28		
Shark fins, dried, unsalted	1 192	8 240	111	1 048
Shark fins, prepared or preserved	78	1 437	22	76
Sharks nei, fresh or chilled	183	107	4	12
Sharks nei, frozen	1 200	1 505	141	741
Total shark commodities	**2 991**	**11 713**	**278**	**1 877**
Total all marine fisheries commodities	**1 056 463**	**3 134 586**	**273 470**	**318 014**

ASSESSMENT OF NATIONAL CAPACITY TO IMPLEMENT CITES REQUIREMENTS

Non-detriment findings

Management regime

Fisheries Law No. 31/2004 (amended by Law No. 45/2009) provides general provisions for fisheries management. Regulation No. 60/2007 on the Conservation of Fishery Resources deals with the conservation of ecosystems, fish species and genetic resources. The following recently enacted regulations by the Ministry of Marine Affairs and Fisheries set additional rules and procedures for the conservation and management of species listed in CITES Appendices: No.35/PERMEN-KP/2013, determining conservation status on fish species; No. 18/ PERMEN-KP/2013, giving full protection for conservation of whale shark, *R. typus;* No. 37/ PERMEN-KP/2013 on the conservation status of Napoleon wrasse, *Cheilinus undulatus*; and No. 4/ PERMEN-KP/2014 giving full protection for conservation of manta rays in Indonesian waters. The regulation of shark catches by fishing vessels operating in the high seas is provided by the ministry regulation No. 12/2012. The Ministerial Regulation of Marine Affairs and Fisheries Regulation Number 1/Permen-Kp/2013 stipulates the provisions on the monitoring of fishing vessels and fish transport vessels stating that all fishing vessels above 30 GT (gross tonnage) and fish transport vessels operating in Indonesia's FMA are required to have an observer onboard, also for recording of bycatch. The Ministerial Regulation of Marine Affairs and Fisheries Number 57/PERMEN-KP/2014, amending the Ministerial Regulation No. 26/2013, regulating the capture fisheries within the Fisheries Management Areas (FMAs) in Indonesia and its Article 73 stated the obligations concerning conservation measures and fish resource management as determined by the Regional Fisheries Management Organizations. The Ministry is currently working on a procedure for determining a quota for international trade in shark fins, especially for hammerhead and oceanic whitetip. A first Indonesian National Plan of Action (NPOA) for Sharks covered the period 2010–2014 and a second NPOA for the period 2015-2019 is being adopted. Indonesia has also developed two other shark-specific management plans. The first management plan was a specific CTI-NPOA created by Indonesia as a member of the regional Coral Triangle Initiative (CTI). The Tuna Skipjack and Tongkol (TCT) management plan was passed by the Directorate General for Capture Fisheries in 2014. This plan focuses on the management of seven shark species: blue *Prionace glauca*, oceanic whitetip, smooth hammerhead, scalloped hammerhead, silky *C. falciformis*, big-eye thresher sharks *A. superciliosus*, and pelagic thresher *Alopias pelagicus* in three fisheries management areas. Indonesia signed the Port State Measures Agreement in 2009 and ratified it in 2016. The country participates in the following RFBs: APFIC, CCSBT, IOTC, SEAFDEC and WCPFC (Cooperating Non-member). The management measures of relevance to the regulation of shark fisheries are summarized in Table 27.

Table 27. Management measures of relevance to shark fisheries in Indonesia. The effectiveness of these measures in addressing the known sources of mortality is noted.

Management measures	Description	Effectiveness
Species prohibitions	Full protection from fishing, consumption, and trading of whale shark (*R. typus*) (Decree of MMAF, No.18/2013). Full protection from fishing, consumption, and trading of manta rays (*Manta* spp.) (Decree of MMAF, No.4/2014). Arrangement from RFMO: i) thresher sharks (*Alopias* spp.) not to be retained and to be released unharmed, to the extent practicable, when caught in association to IOTC regulated fisheries (Resolution IOTC 12/09 2012); ii) oceanic whitetip shark (*C. longimanus*) not to be retained and to be released unharmed, to the extent practicable, when caught in association to IOTC regulated fisheries (Resolution IOTC 13/06 2013); iii) prohibition of setting a purse seine net around a whale shark (*R. typus*), in the IOTC area of competence. (Resolution IOTC 13/05 2015).	**Low - Medium**. The prohibition of manta rays, if accompanied by public awareness and support for alternative livelihoods, can mitigate mortality in target and (to some extent) bycatch fisheries. Non retention policy for whitetip and threshers can lead to reduction of mortality (measures have no impact on hammerheads).
Spatial restrictions	Prohibited fishing for sharks and rays in Raja Ampat waters, West Papua (Regent Regulation No. 9/2012).	**Low – Medium**: Regulation can be effective if stakeholders are actively involved in the implementation (which seems to be the case of Raja Ampat). The prohbition in other areas has been only recently enacted. Closed areas may not adequately address the sources of mortality on migratory species, unless the area under protection is large enough or covers important habitat for the species (unknown in this case).
Gear restrictions	Trawl operations have been prohibited in Indonesian waters since 1980 (Decree of the Ministry of Agriculture No.503/KPTS/UM/1980).	**Low**. Trawling fisheries do not catch sharks in Indonesia. Trawls are sometimes still illegally operated in a few areas where there is a lack of control.
Product form restrictions	Prohibited finning in open oceanic fisheries (e.g. industrial tuna fisheries). As a contracting Party to IOTC and WCPFC, required to apply a 5 percent fin-to-body weight ratio for sharks on board vessels up to the first point of landing. Ban on the exports of hammerhead sharks was put into place starting in December 2015.	**Low-Medium.** Regulation can lead to live release of sharks incidentally caught in tuna fisheries. Relative importance of shark bycatch in tuna fisheries to total catch is unknown. Ban on hammerhead exports can reduce retention in fisheries catching the species, if means for enforcement are in place.
Participatory restrictions	Required licensing for fishing operations in open ocean.	**Low.** This licensing focuses on tuna fisheries, hence it is not very effective for sharks. Limited effect if not used to control access.

Supporting information

Marine capture fisheries in Indonesia are characteristically multi-gear and multi-species, which complicates the collection of accurate species-specific data. Also, some landing points are in remote areas and in small islands of difficult access to be covered regularly by fisheries staff. These factors, in addition to the limited number of fisheries staff, are important impediments to the regular monitoring of fisheries catches and effort. Despite these limitations, marked improvement in the monitoring of shark catches occurred in the last decade (see Figure 16). Catch data for elasmobranchs are divided into nine main groups: thresher sharks, requiem sharks, mackerel sharks, hammerhead sharks, dogfish sharks, stingrays, devilrays, eaglerays, and shovelnose rays (whitespotted wedgefishes). Hammerhead sharks are not differentiated by species (although *S. lewini* is the most common). Oceanic whitetip shark is currently grouped in requiem sharks, but because of its unique appearance it can easily be distinguished from other requiem sharks in the future. Some biological parameters are available for *S. lewini*, and data on abundance trends are available for *Manta birostris* and for hammerheads (Annex 3). For oceanic whitetip, life history parameters have been estimated for the western Pacific (Seki *et al*., 1998) and a stock assessment was carried out for the western central Pacific (Rice and Harley, 2012). The evaluation of abundance trends has been also possible in other oceanic areas (Eastern Pacific, Atlantic and Indian Ocean) thanks to bycatch data collected by tuna RFMOs (FAO, 2013). An NDF for sharks was developed and tested on hammerhead sharks (Fahmi pers. comm.). Based on the hammerhead evaluation, it was determined that the fisheries in Indonesia cannot implement all of the recommendations from the NDF due to the lack of manpower and funding. Therefore, a total ban on the exports of hammerhead sharks was put into place starting 21 December 2015.

Monitoring, Control and Surveillance (MCS) capacity

Enforcement is the weakest point of the shark fisheries management in Indonesia. Some level of monitoring of the tuna fishery is currently facilitated using logbook and observers on board (Annex 4). Other fisheries, including small-scale fisheries, seem to operate without any type of control by enforcement agencies. In fact overfishing and IUU fishing are a major problem in Indonesia because of a lack of human and financial resources for the purpose of MCS (Fischer *et al*., 2013).

Legal acquisition findings

Legislation

Indonesia has enacted different laws and regulations for the management of marine fisheries and for the conservation and management of aquatic species listed in CITES Appendices. For instance the regulations of the Ministry of Marine Affairs and Fisheries No. 18/KEPMEN-KP/2013 and No. 4/ PERMEN-KP/2014 giving full protection for conservation respectively of whale sharks and manta rays in Indonesian waters. Other regulations define closed areas, prohibited gears and the prohibition of finning in open oceanic fisheries. The government is currently considering the adoption of specific norms for the trade in fins, which will be relevant for oceanic whitetip and hammerheads. As a member of IOTC and cooperating Party of the WCPFC, Indonesia has also to comply with rules prohibiting the capture and requiring the live release of oceanic whitetip caught in tuna fisheries in the Indian and Western Central Pacific Oceans (Table 27). According the evaluation conducted by the CITES Secretariat[20], the country legislation meets all the minimum requirements for implementation of CITES (Category 1).

Species identification

Indonesia has improved considerably the reporting of shark catch data in recent years, which in part reflects improvements in the capacity to identify shark species in catches. However, the lack of expertise of field enumerators to identify species and the fact that only part of the shark's body is sometimes landed (fin, gill, gutted) create practical impediments to improve the current system. The CITES management authority has produced a field guide to facilitate the identification of shark species for fisheries staff and other stakeholders, and is also preparing manuals to facilitate the identification of shark fins of the listed species and manta gill rakers (other available tools are listed in Annex 5). The training of fisheries staff, enumerators and field observers on shark identification is also being planned for this year. The use of DNA barcoding is also being

[20] CoP17 Doc. 22 Annex 3 (Rev. 1) Status of legislative progress for implementing CITES (updated on 1 September 2016).

considered as an auxiliary tool for products of difficult identification (e.g. processed fins; skin; meat; cartilage, etc.).

Traceability

There are no traceability mechanisms (e.g. catch and or trade certification, eco-labelling, chain of custody measures, etc.) in place that could assist in the verification of the origin and legality of shark and ray products along the supply chain. Also a considerable part of the shark fisheries are not adequately covered by MCS tools that could facilitate the verification of legality of catches. The Indonesian CITES management authority is currently elaborating regulations to strengthen the control of fisheries and to improve the accuracy of the catch data for the listed species of sharks. These improvements are expected to facilitate the establishment of catch/trade certification in the future.

Institutional collaboration

There seems to be a well-established inter-agency coordination for the implementation of the listings of aquatic species. The CITES management authority is under the coordination of the Ministry of Forestry. The Ministry of Marine Affairs and Fisheries is responsible for managing and determining the export quota of commercially exploited aquatic species, in coordination with the Indonesian Institute of Science as national scientific authority. Since 2013, the MMAF has made some actions to facilitate the implementation of the listings of sharks species, such as the issuing of regulations for the conservation of CITES species, the production of field guides for the identification of shark species and the coordination of national meetings on shark fisheries management.

Indonesia is engaged in different types of bilateral and regional initiatives of relevance to shark fisheries management, including a collaborative research project with Australia in elasmobranch fisheries under ACIAR-CSIRO; a project on sustainable fisheries involving Indonesia, Sri Lanka and Thailand under the Bay of Bengal Large Marine Ecosystem (BOBLME); the Coral Triangle Initiative (with Malaysia, Philippines, Papua New Guinea, Timor Leste and Solomon Islands) aimed to address threats to the coastal marine resources in the region; SEAFDEC initiatives to build regional capacity for the management and conservation of sharks; a collaborative study on fishing activities in the Java Sea sponsored by Indonesia, France and the Europe Union under the PELFISH Project; among others. The outcomes of these initiatives have resulted in recommendations for sustainable fisheries management and the strengthening of national and regional capacity for managing coastal resources. In addition, as a member of tuna RFMOs, Indonesia has adopted several international regulations on sharks under IOTC, CCSBT and WCPFC (discussed above).

Iran (Islamic Republic of)

SUMMARY INFORMATION ON SHARK FISHERIES AND TRADE

Hammerheads and oceanic whitetip are caught as bycatch in gillnet (bottom and drift gillnets), bottom trawl and trolling fisheries in the Persian Gulf and the Oman Sea. A driftnet fishery for tunas has been also operating in high seas areas of the Western Indian Ocean, with a high percentage of sharks in the catches (between 25 percent and 50 percent of the total catches, according to IOTC (2011). Many boats use a combination of fishing gears. In 2003, there were 62 steel-hulled trawlers, 3 011 wooden vessels and 6 764 outboard-powered small boats active in commercial fishing in the region (FAO Fishery Country Profile). Fish resources are mainly shared stocks with the other coastal states, as both Persian Gulf and Oman Sea are narrow seas (there are no high seas areas). Target fisheries for sharks have been banned in Iran since 2004. Sharks represent a small percentage of the trawl fisheries catches, between 0.7 percent and 2.1 percent in weight; [T. Valinassab (Iranian Fisheries Research Organization), pers. comm.]. Shark catches started to be reported to FAO in 1996 being stable at about 14 000 tonnes per year until 2012 when a relative increase at about 17 000 tonnes has been observed, concurrently with the inclease of shark recorded at species level (Figure 17). This improvement followed the recommendation by the RECOFI Commission on minimum data reporting of sharks and rays. *C. falciformis* represent about the 9 percent of the total catch of sharks, followed by *C. longimanus* 0.7 percent, *Sphyrna zygaena* 0.4 percent and the family Pristidae, accounting for less then 0.1 percent. Besides fisheries, marine resources in the Persian Gulf and Oman Sea are under pressure from other anthropogenic and natural processes, such as oil pollution and the recent bloom in jellyfish that affected negatively fisheries in the region (Daryanabard and Dawson, 2008).

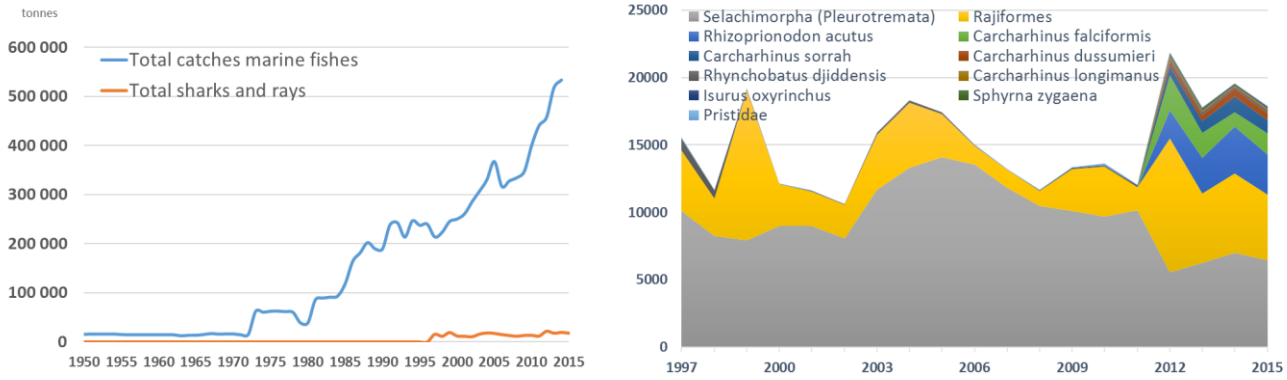

Figure 17. Marine capture fisheries production and the composition of the shark catches of Islamic Republic of Iran. (Source: FAO, 2017a).

Processed fillets of sharks and rays are consumed locally at very low levels. Catches are also used as raw material in some fish meal factories. Dried and salted meat are presumably exported to Pakistan by fishers in Sistan-o-Baluchestan, eastern Oman Sea (borderline with Pakistan). Dried fins are exported without any type of control to other countries, mainly to the United Arab Emirates. According to FAO (2009), the price of fins ranges from 4.0 to 40.0 USD per kg depending on size of fish and size of fins; the normal price of whole sharks without any processing is around 1.5–2.0 USD/kg, while packed fillets are sold at about 3.0–3.5 USD/kg. Export of shark fin reported to FAO from Iran is only available since 2012 in the order of 13 tonnes/year, whereas the imports of frozen sharks is about 318 tonnes/year representing less than 1 percent of the total marine fisheries commodities imported (Table 28).

Table 28. Average (2008 – 2013) trade flow of shark products from Iran (Islamic Republic of) (FAO, 2006c).

Commodity (average 2008-2013)	Export		Import	
	Tonnes	USD'000	Tonnes	USD'000
Shark fins, dried, whether or not salted, etc.	13	365		
Sharks nei, frozen			319	288
Total sharks commodities	**13**	**365**	**319**	**288**
Total all marine fisheries commodities	**38 826**	**134 833**	**45 294**	**60 146**

ASSESSMENT OF NATIONAL CAPACITY TO IMPLEMENT CITES REQUIREMENTS

Non-detriment findings

Management regime

The legal framework is provided by the Protection and Exploitation of the Fisheries Resources of the Islamic Republic of Iran approved in 1995. The law establishing the Fisheries Organization was approved in 2005 to implement objectives of the Law of 13 September 1995 of Protection and Exploitation. Policy making, planning, monitoring the sustainable exploitation of aquatic resources and maintenance of the fishing infrastructure are main functions of this Organization. The country has not yet developed an NPOA-Shark. It has not ratified the FAO Port State Measures Agreement. Different management measures of relevance to sharks have been established and are summarized in Table 29. Iran is a member of the IOTC and of RECOFI and has to follow specific measures for shark conservation.

Table 29. Management measures of relevance to shark fisheries in the Islamic Republic of Iran. The effectiveness of these measures in addressing the known sources of mortality is noted.

Management measures	Description	Effectiveness
Species prohibitions	Full ban of targeted shark fisheries (2004). As a member of IOTC and RECOFI, Iran observes the reservation and management measures for sharks of these organizations : i) thresher sharks (*Alopias* spp.) not to be retained and to be released unharmed, to the extent practicable, when caught in association to IOTC regulated fisheries (Resolution IOTC 12/09 2012); ii) oceanic whitetip shark (*C. longimanus*) not to be retained and to be released unharmed, to the extent practicable, when caught in association to IOTC regulated fisheries (Resolution IOTC 13/06 2013); iii) prohibition of setting a purse seine net around a whale shark (*R. typus*), in the IOTC area of competence. (Resolution IOTC 13/05 2015); RECOFI Recommendation RECOFI/6/2011/1 on minimum data reporting in the RECOFI area, containing also the request of making available to the Commission the information on catch of sharks and rays.	**Low - Medium.** Banning direct fisheries will prevent the development of new fisheries for sharks, which would increase pressure on the resources. However, the species are now mainly caught as bycatch, which is not affected by this regulation. Release measure for whitetip and threshers may decrease mortality in driftnet fisheries, although post-capture mortality is unknown.
Temporal restrictions	Fish bottom trawlers open 135 days per year in the Oman Sea.	**Low-Medium.** Measure establishes a cap on the maximum effort of trawlers and therefore limits the

Management measures	Description	Effectiveness
	Shrimp bottom trawlers open 45 days per year in each province (Bushar, Hormozgan, Khozistan). Fishery is closed if CPUE falls below a certain level.	pressure on sharks caught as bycatch.
Spatial restrictions	Bottom trawlers banned in the Persian Gulf since 1993. Some marine near shore habitats (such as lagoons, seagrass, tidal flats and estuaries) protected through the Ramsar Convention on Wetlands of International Importance.	**Low - Medium**: Banning bottom trawling expected to reduce pressure on sharks caught as bycatch. The coastal areas under protection are of potential importance for sharks as nurseries. The migratory nature of the species reduces the effectiveness of these measures.
Gear restrictions	Fish bottom trawlers prohibited in the Persian Gulf since 1993.	**Low - Medium**. See above.
Product form restrictions	Prohibited finning (law in effect since 2003; T. Valinassab, pers. comm.). As Contracting Party to IOTC, required to apply a 5 percent fin-to-body weight ratio for sharks on board vessels up to the first point of landing.	**Low-Medium.** Regulation can lead to live release of sharks incidentally caught in commercial fisheries. Post-capture mortality (unknown) can offset benefits.
Capacity restrictions	Ongoing buy-back program reduced number of trawlers from 69 to 31.	**Medium.** Country had a problem of overcapacity of the fleet and the fleet reduction provides direct benefit for reducing fishing pressure.
Participatory restrictions	Required licensing for fishing operation.	**Low.** Limited effect if not used to control access.

Supporting information

Fisheries catches are monitored in the Persian Gulf and the Oman Sea in about 35 sampling stations distributed in ca. 2 000 km of coastline (FAO, 2009). In spite of the occurrence of ca. 42 species of sharks and rays in the coast of the Islamic Republic of Iran (T. Valinassab, pers. comm.), only the catches of few species are specifically reported to FAO. Rays are mostly reported as a group, whereas some improvement on reporting of sharks is evident in the last years, expecially for requiem sharks of the family Carcharhinidae, included in the list of priority species of the RECOFI Commission. There are no biological data on the listed species caught in the country. The abundance of demersal species is assessed annually since 2003 through bottom trawl surveys in the Persian Gulf and Oman Sea.-Survey data disaggregated by species, could provide the basis for monitoring trends in hammerheads (assuming a significant and constant vulnerability of the species to bottom trawls). Likewise, disaggregated catch data, could make it possible to monitor the trends in CPUE of the listed species in key fisheries. Iran is also currently carrying out surveys to determine the level of heavy metals in main shark species.

Monitoring, Control and Surveillance (MCS) capacity

Enforcement of regulations is problematic due to the limited MCS capacity (Annex 4). Despite considerable investments by government in surveillance activities, illegal fishing methods are still common in Iran (FAO Fishery Country Profile). The weak MCS capacity favours for instance the presumably illegal cross-border trade in shark products (e.g. to Pakistan and the United Arab Emirates), reported above.

Legal acquisition findings

Legislation

The legislation in the Islamic Republic of Iran defines general management measures which are relevant for the management of sharks and rays (Table 29). There are no national specific provisions for the harvest and trade in the listed species. However, the laws in place can provide some basis for making the legal acquisition findings, if adequate knowledge is available about the origin of the products in trade and the compliance with the norms can be verified. According to the evaluation conducted by the CITES Secretariat[21], the country's legislation meets all the minimum requirements for the implementation of CITES (Category 1).

Species identification

It seems that the country has enough capacity to identify the species in the catches, considering the accumulated experience with bottom trawl surveys and also the availability of manuals and field guides for the region (Annex 5). No information could be obtained to evaluate the capacity to identify species in the products in trade. The information obtained through the consultation indicates that most of the exports (meat and fins) are currently illegally smuggled across the border with other riparian states. The fin guides available, if properly distributed and used would be instrumental to control the trade with neighbouring countries. The identification of species traded as salted/dried meat will likely demand the use of DNA techniques or other means of identification.

Traceability

A system of catch certification seems to be in place, but no further information could be obtained to evaluate its relevance to determine the origin of shark catches in trade. The fishing fleets are covered by a system of logbooks. On the other hand they are only partially covered by VMS, observers on board and sea/port inspection mechanisms that could be used to certify the validity of the catch data presented in the logbooks. Without an adequate system of patrolling, vessel monitoring and regional cooperation among riparian states it will be practically impossible to address the apparent illegal cross-border trade in shark products, which seems to be the main source of exports at the moment.

Institutional collaboration

There is no apparent impediment for the collaboration between fisheries and CITES authorities in the country. The Iran Fisheries Organization (IFO) is one of the CITES management authorities in the country, while the Iranian Fisheries Research Organization (IFRO) is one of the CITES scientific authorities. However, there has been no preparatory work done some far to implement the new listings.

In spite of the attempts for more cooperation and joint management with the other 7 neighbouring countries of the Persian Gulf and Oman Sea, the Regional Commission for Fisheries (RECOFI) has not been successful yet in harmonizing fishery measures in the area. Important advancements were made however in the adopting minimum data reporting requirements. Participation in the IOTC, on the other hand, requires the country to follow internationally agreed norms for the management and conservation of sharks caught in tuna fisheries in the Indian Ocean. At the moment, in the Islamic Republic of Iran these fisheries have minor importance for the listed species.

[21] CoP17 Doc. 22 Annex 3 (Rev. 1) Status of legislative progress for implementing CITES (updated on 1 September 2016).

The Republic of Korea

SUMMARY INFORMATION ON SHARK FISHERIES AND TRADE

There are no target fisheries for sharks in the Republic of Korea. Sharks and rays are caught as bycatch in different commercial fisheries in national waters and in tuna fisheries operating in international waters. Sharks and rays accounted for the following percentage of the catches of commercial fisheries in recent years: purse seiners (17 percent); anchovy trawler (12 percent); small gillnet (6 percent); offshore pole and line (5 percent); large trawlers (5 percent). According to the information obtained through the consultation (FAO, 2014b), none of the listed species are currently caught in national waters. Catches in international waters by tuna longline and purse seine fisheries are considered likely, but no species-specific data is available. Shark catches are recorded as "sharks" and "rays", only negligible values of rays are reported at species level (Figure 18). Sharks represent less than 1 percent of the total marine catches of the Republic of Korea in recent years.

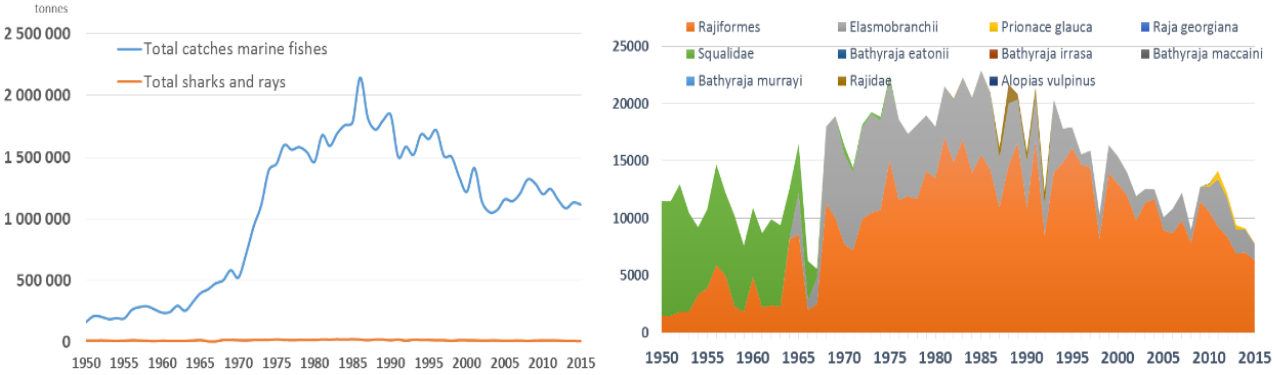

Figure 18. Marine capture fisheries production and the composition of the shark catches of the Republic of Korea (Source: FAO, 2017a).

Sharks and rays are consumed in certain areas of the country. Fresh fins and meat are sold in the local markets. Imports of sharks and rays (mainly skates *Raja* spp. from Chile) also supply the local demand (Table 32). According to FAO data, the Republic of Korea is not a major exporter of shark products. Among the products exported in recent years are shark fins (dried, unsalted) and frozen sharks, rays and skates (Table 30). There is no species-specific trade data available to determine the importance of the listed species in the exports.

Table 30. Average (2008 – 2013) trade flow of shark products from the Republic of Korea (FAO, 2016c).

Commodity (average 2008–2013)	Export		Import	
	Tonnes	*USD'000*	*Tonnes*	*USD'000*
Rays and skates (Rajidae), fresh or chilled	0	2	348	1 454
Rays and skates (Rajidae), frozen	35	71	12 184	41 430
Shark fins, dried, unsalted			3	185
Shark fins, dried, whether or not salted, etc.	58	2 248	2	160
Shark liver oil	32	199	108	1 899
Sharks nei, fresh or chilled	0	0	1	1
Sharks nei, frozen	1 445	1 914	2 326	5 203
Sharks, rays, chimaeras nei, frozen	35	57	5 662	13 607
Total shark commodities	**1 604**	**4 491**	**20 633**	**63 940**
Total all marine fisheries commodities	**639 957**	**1 811 007**	**1 239 500**	**3 390 980**

ASSESSMENT OF NATIONAL CAPACITY TO IMPLEMENT CITES REQUIREMENTS

Non-detriment findings

Management regime

The fisheries management in the Republic of Korea is based on the 2009 Fisheries Resources Management Act, consolidated in 2015 and its enforcement decrees, the "Enforcement Decree of the Fishery Resources Management Act, 2010" and the "Enforcement Decree on the Act on the exercise of sovereign rights on foreigners' fishing. within the Exclusive Economic Zone", updated in 2012. Relevant regional and international

obligations are implemented through the 2007, and consolidated in 2013, Distant Water Fisheries Development Act, implemented by the National Plan of Action of the Republic of Korea to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (FAOLEX, 2016b). In addition, the 2004 Wild Fauna and Flora Protection Act and its Enforcement Regulations ensure that CITES provisions are implemented. To manage shark species in the Republic of Korea's EEZ, the government set up the Fishery Resources Management Plans in accordance with the Fishery Resources Management Act A. 'Fishery Resources Management Committee' reviews and evaluates the implementation of this plan. Under this plan, a TAC system is applied to certain species and/or areas that need to be conserved or managed (only the mottled skate, *Raja pulchra*, is being managed under such TAC system, S. Kweon (National Institute of Biological Resources), pers. comm.). The NPOA-Sharks was adopted in 2011, focusing initially on the distant water fisheries and with the following foreseen actions: enhancement of the current observer training programs; stock assessments on major shark species; surveys on the trade of sharks; management of the CITES-listed shark species; and the creation of a "distant water sharks management committee" for better management of incidentally caught sharks. The Republic of Korea has not ratified the Port State Measures Agreement. The country is a member of all tuna RFMOs: CCSBT, ICCAT, IATTC, IOTC and WCPFC.

Table 31. Management measures of relevance to shark fisheries in the Republic of Korea. The effectiveness of these measures in addressing the known sources of mortality is noted.

Management measures	Description	Effectiveness
Species prohibitions	The Republic of Korea is a member of CCAMLR, ICCAT, IOTC, IATTC, NPFC, SPRFMO and WCPFC. Therefore, vessels from the Republic of Korea observe the reservation and management measures for sharks of these organizations for hammerhead sharks (*Sphyrna* spp.), oceanic whitetip shark (*C. longimanus)*, porbeagle (*Lamna nasus*), thresher sharks (*Alopias* spp.), silky shark (*C. falciformis*); whale sharks (*R. typus*) and mobulid rays (which includes manta rays and mobula rays) (FAO, 2016a)	**Low – Medium**: No retention policy can lead to reduction of mortality. Measures with no effect on manta rays, porbeagle and on hamemrheads in the Indo-Pacific.
Spatial restrictions	Area restrictions for purse seine fisheries intended to minimize incidental catches of sharks (Fischer *et al*., 2012).	**Low.** Spatial restrictions will have a limited effect when both fisheries resources and fishing fleets are highly mobile (sharks and purse seines). Unless protected areas coincide with nursery/breeding areas (unknown).
Product form restrictions	Prohibited finning in fisheries regulated by tuna RFMOs (IOTC, ICCAT, IATTC, CCSBT, WCPFC). Required to apply a 5 percent fin-to-body weight ratio for sharks on board vessels up to the first point of landing.	**Medium.** Regulation can lead to live release of sharks incidentally caught in tuna fisheries and to a consequent decrease in catches. Post-release mortality unknown.
Participatory restrictions	Required licensing for fishing operation.	**Low.** Limited effect if not used to control access.

Other	All fish species (including sharks) harvested in high sea must be reported to the National Fishery Products Quality Management Service.	**Low.** Contributes to MCS and to the traceability of shark species introduced from the sea.

Supporting information

As a member of tuna RFMOs, the Republic of Korea is required to report catch data for shark species caught in tuna fisheries regulated by these bodies. According to Fischer *et al*. (2012) the government has recently prioritized the identification of shark species and has provided crew of the Republic of Korea's distant water fleets with a field guide on bycatch species. The adoption of the NPOA-Sharks also places a strong emphasis on improving data for the stock assessment of sharks. The practical effects of these efforts have not been translated into better catch statistics. As demonstrated above, reported catch data remains highly aggregated and do not provide the necessary information to monitor the trends in the listed species. As part of the data requirements by RFMOs, scientific observers on board the fishing vessels are collecting biological data of shark species, including oceanic whitetip and hammerheads. At present, this data has been used to characterize the size composition by species and the temporal and spatial distribution.

Monitoring, Control and Surveillance (MCS) capacity

The Republic of Korea has the necessary means to enforce the shark-related regulations adopted by RFMOs. According to the information obtained in the consultations held during the FAO/CITES workshop, the country is keeping and maintaining catch records and releasing incidentally caught species of sharks under protection, such as oceanic whitetip and hammerheads. The distant water fleets are covered by logbooks, by observers on board according to the RFMOs requirements and are fully covered by VMS (Annex 4). Also, all fish species (including sharks) harvested in the high seas must be reported to the National Fishery Products Quality Management Service (FIQ) within less than 7 days after harvest. No information could be obtained on the status of implementation of MCS tools in domestic fisheries, but their relevance to the listed species is likely to be minor compared to the distant water fleets.

Legal acquisition findings

Legislation

High sea fisheries from the Republic of Korea that are catching the listed species of sharks must comply with the regulations adopted by the RFMOs where they operate. These regional and international obligations are implemented through the 2008 Distant Water Fisheries Development Act, revised in 2012. Fisheries management is also based on the 2009 (2015) Fisheries Resources Management Act. The 2004 Wild Fauna and Flora Protection Act of the Republic of Korea and its Enforcement Regulations ensure that CITES provisions are implemented. Overall, the legislation in place provides a comprehensive set of norms to regulate the capture of sharks in high seas fisheries (Table 31). According the evaluation conducted by the CITES Secretariat[22], the country legislation meets all the minimum requirements for implementation of CITES (Category 1).

Species identification

An identification manual for high sea fisheries' observers has been published by the Government from the Republic of Korea to facilitate the identification of bycatch species. However, the availability of this manual has not yet led to improved reporting of shark catch statistics, which remains highly aggregated. A similar manual for customs of the Republic of Korea is planned to be prepared. The examples of manuals listed in the Annex 5 could be used to facilitate the visual recognition of fins.

Traceability

The catch certification system in place for distant water fleets could be useful to determine the origin and legality of shark catches taken in the high seas. According to this system, the FIQ issues a certificate of legal

[22] CoP17 Doc. 22 Annex 3 (Rev. 1) Status of legislative progress for implementing CITES (updated on 1 September 2016).

catch with Confirmation Catching of Master of Fishing Vessel and a Distant Water Fishing License. This document could serve as the base for the legal acquisition findings.

Institutional collaboration

The Ministry of Oceans and Fisheries is in charge of all fisheries from the Republic of Korea and receives scientific advice from the National Fisheries Research and Development Institute (NFRDI). The Ministry of Environment is the CITES Management Authority, while the NFRDI and National Institute of Biological Resources (NIBR) are the two CITES Scientific Authorities. Usually there is a settled administration division of labour between CITES Authorities and Fisheries agencies and the two agencies cooperate when needed. Since the CITES CoP16, CITES and fisheries authorities have been discussing the method of domestic implementation of the new shark and manta ray listings, specially the issuing of certificates of Introduction from the Sea. In the international/regional arena, the Republic of Korea participates in 5 tuna RFMOs and must comply with management measures and data collection programs established by these organizations to improve the conservation status of sharks caught in tuna fishing operations.

Malaysia

SUMMARY INFORMATION ON SHARK FISHERIES AND TRADE

Sharks and rays are mainly caught as bycatch in trawl and gillnet fisheries, with small quantities also taken in long-line and purse seine fisheries (Lack & Sant 2011, 2012; DoFM 2014). Trawls are the main cause of shark bycatch in Malaysia, contributing to 88 percent of the country's total shark catch (SEAFDEC 2006).The landings of sharks and rays from 1950–2015 contributed between 1-2 percent of the total marine landings in Malaysia; about 67 percent of elasmobranch captures in Malaysia are rays, stingrays, and mantas. Landing fluctuated with an average of about 5 000 tonnes of sharks and 8 000 of rays in the 80s to 7800 tonnes of shark landings and 14 000 tonnes of ray landings per year in the last decade (Figure 19). Of the species listed in 2013, the scalloped hammerhead, *S. lewini*, and the great hammerhead, *S. mokarran*, are caught in commercial fisheries, mainly as bycatch in industrial trawling but also in small-scale hook-and-line and driftnet fisheries. Catches are however considered rare because of the nature of the fishing ground and the selectivity of the gears used. Manta rays (*M. birostris* and *M. alfredi*) are reported by divers and fishers in Sabah (Borneo). However there is no information on catches of manta rays in the country. Recent improvements in the recording of sharks and rays to the species level has been assisted by several initiatives. In collaboration with FAO and SEAFDEC, the collection of landings, biological and taxonomimc data is being carried out since 2013. However, in the official statistics, until recent years catches have been reported in highly aggregated categories, only allowing for the separation of "sharks" and "rays".

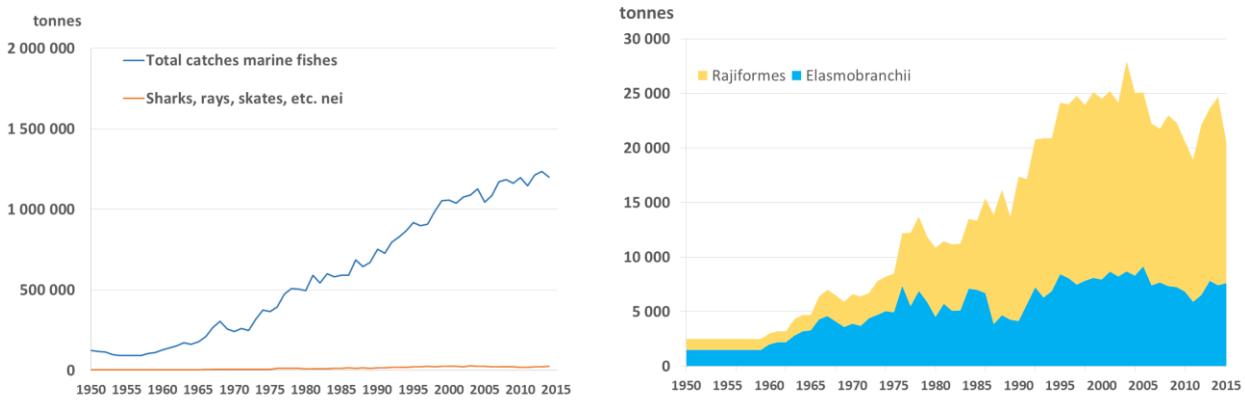

Figure 19. Marine capture fisheries production and the composition of the shark catches of Malaysia (Source: FAO, 2017a).

Malaysia is an important contributor to shark and ray fisheries in the Southeast Asian region, but imports more elasmobranch products than it exports (SEAFDEC 2006, Lack & Sant 2011). Along with Singapore and Thailand, Malaysia makes up nearly all of the elasmobranch fresh and frozen meat imports reported in the Southeast Asian region (SEAFDEC 2006). The volume of catches of the listed species is considered very small and most of it is probably consumed locally. All edible parts of sharks (including meat and fins) are fully utilized in fresh or salted form. Through the 1999 Regulations and the 2008 Endangered Species Act, Malaysia prohibited exportation of any CITES listed elasmobranchs. FAO trade data shows that Malaysia exported ca. 330 tonnes of fins in recent years, the bulk of it prepared or preserved fins (Table 32). Frozen sharks were also exported (35.8 tonnes). The country also imported these products in higher quantities from 2008 to 2013. Overall, the reported trade in shark products represents only a minor proportion of the total trade in marine fisheries commodities.

Table 32. Average (2008 – 2013) trade flow of shark products from Malaysia (FAO, 2016c).

Commodity (average 2008–2013)	Export		Import	
	Tonnes	*USD'000*	*Tonnes*	*USD'000*
Rays and skates (Rajidae), fresh or chilled	13	13	100	273
Rays and skates (Rajidae), frozen	2	3	67	152
Shark fins, dried, whether or not salted, etc.	15	155	35	222
Shark fins, prepared or preserved	395	1 860	5 074	8 775
Shark fins, salted and in brine but not dried or smoked	2	40	16	219
Sharks nei, frozen	18	52	51	197
Total shark commodities	**444**	**2 122**	**5 343**	**9 837**
Total all marine fisheries commodities	**273181**	**802995**	**411225**	**868055**

ASSESSMENT OF NATIONAL CAPACITY TO IMPLEMENT CITES REQUIREMENTS

Non-detriment findings

Management regime

The legal framework to fisheries development and management is the Fisheries Act of 1985. The harvesting and trade of CITES-listed sharks and rays are additionally regulated by the Fisheries (Control of Endangered Species of Fish) Regulations of 1999 and the International Trade in Endangered Species Act of 2008 (Act 686). All species listed under CITES Convention are listed under the Act 686 as Third Scheduled (Appendices I, II and III) and as such are not allowed to be exported (zero quota). The first NPOA-Sharks was adopted in 2006 and reviewed in 2014. Malaysia has not ratified the Port State Measures Agreement. The country is a member of the following RFBs: APFIC; IOTC and SEAFDEC. Table 33 summarizes the management measures in place of relevance to the management of the listed species.

Table 33. Management measures of relevance to shark fisheries in Malaysia. The effectiveness of these measures in addressing the known sources of mortality is noted.

Management measures	Description	Effectiveness
Species prohibitions	Malaysian government imposed a zero quota export on the newly listed sharks and rays, effective on 14 September 2014. Whale shark and all sawfishes were protected under two Acts namely Fisheries Act 1985; Fisheries (Control of Endangered Species of Fish) Regulations 1999, and International Trade in Endangered Species Act 2008 (Act 686). As a member of IOTC, the country observes the following reservation and management measures: i) thresher sharks (*Alopias* spp.) not to be retained and to be released unharmed, to the extent practicable, when caught in association to IOTC regulated fisheries (Resolution IOTC 12/09 2012); ii) oceanic whitetip shark (*C. longimanus*) not to be retained and to be released unharmed, to the extent practicable, when caught in association to IOTC regulated fisheries (Resolution IOTC 13/06 2013); iii) prohibition of setting a purse seine net around a whale shark (*R. typus*), in the IOTC area of competence. (Resolution IOTC 13/05 2015);	**Medium:** measure can be highly effective if enforcement is adequate to ensure compliance. Effectiveness is reduced because hammerheads are also consumed locally and are mostly caught as bycatch in trawl fisheries (post-release mortality unknown). IOTC measure not relevant for the hammerheads.

Management measures	Description	Effectiveness
Spatial restrictions	Protection of breeding and nursery grounds of sharks and rays with big-size anti-trawling artificial reefs (120 new AR sites implemented between 2006 – 2014). Fishing activities not allowed within Marine Parks and Marine Protected Areas (the country has over 50 MPAS , most of them of small size < 100 km2). Zoning system for fishing fleets established with a view to protect nursery areas and avoid conflict among fishers. Traditional fishing zone (Zone A) was extended from 5 nm to 8 nm from coastline effectively in 2014.	**Low - Medium.** The protection of critical habitats can have beneficial effects on the populations. Benefits of small MPAs reduced because of the migratory nature of the species.
Gear restrictions	Prohibited use of explosive, poison or pollutant, the use of electric shock, pair trawling and push nets. The locally known 'pukat pari', a drift net with a mesh size of more than 25.4 cm (ten inches), which was once used to catch large sized sharks and rays has been banned since 1990. Commercial gears such as trawlers and purse seine were prohibited to operate within 8 nm from coastline.	**Medium.** The banning of the driftnet fishery (and trawlers within 8 nm) can help reduce the excessive exploitation of sharks and rays and provided some conservation of the breeding stocks**.**
Product form restrictions	Finning is prohibited according to Section 8(b) Fisheries Act of 1985. Measure enforced in 2014 (fin-attached regulation). International trade was controlled under the International Trade in Endangered Species Act 2008 (Act 686). At present, the export of any CITES listed sharks, manta rays and sawfishes originating from Malaysia is not allowed. Zero quotas were applied for export and import. Malaysian government, on May 2014, ban the serving of shark fin soup at all official events.	**Low - Medium.** Regulation can lead to live release of sharks incidentally caught in trawling and other small-scale fisheries targeting higher value resources. Post-release mortality unknown. Since sharks are fully utilized, benefit of the measure is limited.

Supporting information

The present statistical data collection does not record landings by species. Malaysia reports its catches by groups of 'sharks' and 'rays' but not by species. A pilot project on recording landing data up to the species level for all shark and ray species at 11 landing points was initiated in 2013, sponsored by Bay of Bengal Large Marine Ecosystem Program (BOBLME). Also, with the support of SEAFDEC a pilot project to record landings for priority species of sharks (including all CITES listed species) was initiated in Perak in 2013. This program was extended to the state of Sabah, Sarawak and Perak in 2015. Fishery monitoring and documentation in Malaysia has improved since the most recent CITES listing. The data collection system for fishery data in Malaysia has slightly improved from a digital system being used prior to CoP16 listings to a national standardized digital system after the listing. Currently, the DoF is using the existing system for data storage and sharing data within the department on a trial basis in just a few states (e.g., Perak and Sabah). This data collection and sharing mechanism will hopefully be expanded nationwide, but the ability to do so is limited by a lack of resources (the country has more than 2 000 landing sites/private jetties).

The DoFM has also initiated collaboration with ASEAN-WEN (Wildlife Enforcement Network) at the regional level since 2014. This collaboration is mainly for the exchange of information about shark biology and stocks. The improvement in the recording of sharks and rays to the species level has been assisted by several initiatives to collect landing data, biology, and taxonomy data that have been conducted since 2013 by the national government in collaboration with FAO and SEAFDEC. Some biological information is available for hammerheads and manta rays, including on maturity and nursery areas, which could be used to support the adoption of precautionary measures (such as the protected areas already in place). None of the listed species have been assessed in Malaysian waters and no data is currently available to monitor abundance trends.

Monitoring, Control and Surveillance (MCS) capacity

Malaysia's waters are divided into four fishing zones with varying access regulations on fishing effort, total allowable catch (TAC) and quotas, monitoring, control and surveillance (MCS), and enforcement measures. However, Malaysia has limited MCS capacity to enforce the regulations established for sharks (Annex 4). The existence of VMS for larger vessels could be used to assist the enforcement of spatial restrictions, but without regular port and/or sea inspections enforcement becomes ineffective.

Legal acquisition findings

Legislation

The country has in place legislation providing for the management of marine fisheries (Fisheries Act 1985), the conservation of endangered species (Fisheries (Control of Endangered Species of Fish) Regulations 1999) and the trade in CITES listed species (International Trade in Endangered Species Act 2008 (Act 686)). Malaysia enforced Act 2008 in 2010, appointing the Department of Fisheries Malaysia, Department of Fisheries Sabah and Sarawak Forestry Department as Management Authority for Fish and Marine Animals. At present whale shark and all sawfishes were protected in Malaysia under the above Acts. According to Act 686 a zero quota for export and import is applied to all CITES listed species (Appendix I, II and II). The only changes to legal regulations in Malaysia since the recent CoP16 listings were the new licensing measure against finning and the zero quotas on the newly listed species, both of which were put into effect in 2014. In July 2016, the federal government also extended protection to oceanic whitetip sharks, four species of hammerhead sharks, giant oceanic manta rays (*M. birostris*), and reef manta rays (*M. alfredi*) as endangered species (Ftonnes 2016). The Environment Ministry recently proposed an Act to protect sharks in Malaysian waters, which is under consideration by the Environment Ministry and the Ministry of Agriculture (Ftonnes 2016). Technical management measures established by these and other specific by-laws are summarized in Table 33. According the evaluation conducted by the CITES Secretariat[23], the country legislation meets all the minimum requirements for implementation of CITES (Category 1).

Species identification

Malaysia has a high diversity of shark species in the EEZ (146 sps recorded since 1990) making the identification of species in the catches very difficult by untrained and inexperienced enumerators. Field guides for shark and rays are locally available (e.g. Ahmad *et al*., 2013). The Department of Fisheries organizes training on taxonomy and biology of sharks almost every year since 2004, mainly for officers who are actively involved in data collection at landing sites. SEAFDEC and BOBLME have also organised trainning workshops on shark taxonomy and biology for Southeast Asian countries, in which Malayisa took part. However, one recurrent problem is that trained officers are usually transferred to other sections after getting promoted. A training program to identify fresh sepecimens of sharks and rays (whole body) and dried sharks fins manually was proposed in 2014. Expertise and facilities to use DNA technique are very limited. Research on the identification of sharks and rays using DNA bar-cording is ongoing in collaboration with SEAFDEC.

[23] CoP17 Doc. 22 Annex 3 (Rev. 1) Status of legislative progress for implementing CITES (updated on 1 September 2016).

Traceability

The country has no traceability mechanism implemented that could assist in the verification of the origin and legality of shark and ray products along the supply chain. The fishing fleets are covered by a system of logbooks. On the other hand, they are only partially covered by VMS, dockside monitoring and sea/port inspection mechanisms that could be used to certify the validity of the catch data presented in the logbooks. The very large number of landing sites makes the control of catches challenging.

Institutional collaboration

In Malaysia, fisheries agencies are fully involved in the implementation of CITES for marine species. The Department of Fisheries Malaysia, Department of Fisheries Sabah and the Sarawak Forestry Department are Management Authorities for fish and other marine life, while the lead Management Authority at Federal Level is Ministry of Natural Resources and Environment. In addition, the National CITES Committee for fish and other marine life at the federal level is chaired by the Director General of Fisheries Malaysia. The Department of Fisheries has also initiated collaboration with ASEAN-WEN (Wildlife Enforcement Network) at the regional level since 2014. This collaboration is mainly for the exchange of information about shark biology and stocks.

Malaysia actively participates in regional initiatives towards the conservation and sustainable use of fisheries resources (including sharks) organised by the Coral Triangle Initiative (CTI), the Sulu-Sulawesi Marine Eco-region (SSME), SEAFDEC and BOBLME. Malaysia has been a member of the IOTC since 1998. By virtue of its membership, Malaysia has to comply with IOTC Resolutions concerning data reporting and the conservation of sharks caught in association with fisheries managed by IOTC.

Pakistan

SUMMARY INFORMATION ON SHARK FISHERIES AND TRADE

There are no target fisheries for sharks in Pakistan. Hammerheads and manta rays are caught as bycatch, mainly in industrial shrimp trawling and gillnet fisheries for tuna and other species. Some level of catch also occurs in small-scale fisheries. There are approximately 500 gillnet vessels and around 800 trawlers in operation in Pakistan. No specific landings data is available. Catch data reported to FAO disaggregate sharks and rays in four taxonomic groups: sawfishes, requiem sharks, Rajiformes and guitarfishes. The bulk of catches are requiem sharks and rays. Total catches of sharks and rays reached a peak of over 70 000 tonnes per year in the 1970s, dropped in the 1980s recovering again during the 1990s (Figure 20). 45 000 tonnes per year was reached in 1999 and then the catches decreased again until 2010. The average catches in the recent decade are 14 500 tonnes per year, representing ca. 4–5 percent of the total marine capture fisheries landings.

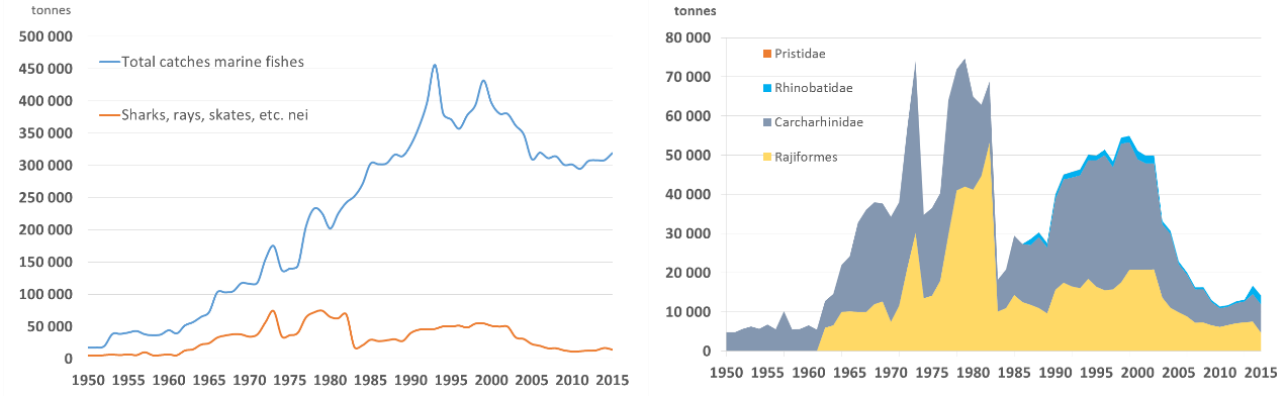

Figure 20. Marine capture fisheries production and the composition of the shark catches of Pakistan (Source: FAO, 2017a).

The landed catches of sharks and rays are auctioned and sold in either local markets or to exporters in the case of fins. The meat is sold to local vendors who sell it as fried finger fish, whereas the skin is dried and sent for processing of poultry feed. Fins are exported (historically dried and salted) to countries where there is market demand (including Philippines, Thailand and Taiwan Province of China). A considerable volume of fins were exported in the past (in the order of 100 – 300 tonnes per year), but since 2003 no exports of fins have been reported to FAO. It is likely that a smaller volume of trade still occurs. Currently, only small volumes of sharks fresh, chilled or frozen are exported, representing an insignificant percentage of the total trade in marine commodities (Table 34).

Table 34. Average (2008 – 2013) trade flow of shark products from Pakistan (FAO, 2016c).

Commodity (average 2008–2013)	Export		Import	
	Tonnes	*USD'000*	*Tonnes*	*USD'000*
Sharks nei, fresh or chilled	2	3		
Total sharks commodities	2	3		
Total all marine fisheries commodities	**141 400**	**285 660**	**2 645**	**5 523**

ASSESSMENT OF NATIONAL CAPACITY TO IMPLEMENT CITES REQUIREMENTS

Non-detriment findings

Management regime

The current legislative fisheries framework in the country is the Exclusive Fishing Zone (Regulation of Fishing) Act, 1975 as amended in 1993. This extends to all Pakistan and to waters within its exclusive fishery zone beyond territorial waters. It regulates the management of fishing in exclusive economic zone of the country. Other relevant laws are: Pakistan Trade Control of Wild Fauna and Flora Act, 2012; Customs Act, 1969 (Export Policy Order); Pakistan Fish Inspection and Quality Control Act, 1997; Pakistan Fish Inspection and Quality Control Rules, 1998; Sindh Fisheries Ordinance, 1980; and the Balochistan Sea Fisheries Act No. IX, 1971 amended by the Balochistan Sea Fisheries (Amendment) Act, 2014. A national fisheries plan was prepared in 2007 to provide a policy framework and strategy for the development of fisheries and aquaculture in Pakistan. The plan recognized as main issues for fisheries management: weak inter-agency coordination, legislation shortcomings, lack of trained manpower and suitable facilities in management organizations and research institutions, inadequacies in research and data sampling, over-exploitation of resources, use of harmful fishing methods, increase in pollution and environmental degradation and lack of infrastructure (Fischer *et al*., 2013). The NPOA-Sharks is being prepared by the Marine Fisheries Department in collaboration with the WWF-Pakistan. A national-level consultative workshop of stakeholders was held in March 2016 to finalize the draft Plan of Action, currently under adoption. Pakistan has not ratified the Port State Measures Agreement. The country is a member of APFIC and IOTC. The management measures of relevance to shark fisheries are summarized in Table 35.

Table 35. Management measures of relevance to shark fisheries in Pakistan. The effectiveness of these measures in addressing the known sources of mortality is noted.

Management measures	Description	Effectiveness
Species prohibitions	Thresher sharks (*Alopias* spp.) not to be retained and to be released unharmed, to the extent practicable, when caught in association to IOTC regulated fisheries (Resolution IOTC 12/09 2012). oceanic whitetip shark (*C. longimanus*) not to be retained and to be released unharmed, to the extent practicable, when caught in association to IOTC regulated fisheries (Resolution IOTC 13/06 2013). Prohibited setting a purse seine net around a whale shark (*R. typus*), in the IOTC area of competence. (Resolution IOTC 13/05 2015).	**Low-Medium:** The relative importance of catches in tuna fisheries is unknown. Expected some level of reduction in mortality on whitetip and threshers. Measure with no effect on hammerheads and manta rays.
Temporal restrictions	Fishing closure from June to July each year, because of shrimps' breeding season and monsoon season.	**Low.** Although implementation is effective, such a short temporal closure will have little effect on fishing mortality.
Product form restrictions	Prohibited finning in fisheries regulated by IOTC. Required to apply a 5 percent fin-to-body weight ratio for sharks on board vessels up to the first point of landing.	**Low-Medium:** The relative importance of catches in tuna fisheries is unknown. Market for meat and fins reduces expected benefit of finning regulation.

Management measures	Description	Effectiveness
Gear restrictions	Restriction on gear type and size (Sindh Fisheries Ordinance, 1980).	**Unknown.** Implementation of these measures has been apparently weak.
Minimum size	Prohibited capture of juvenile fish (Sindh Fisheries Ordinance, 1980).	**Unknown.** No information on minimum sizes for sharks.
Participatory restrictions	Access regulations through licenses applicable to industrial fisheries (Exclusive Fishing Zone Act, 1975)	**Low.** Without imposing limits to entry, licensing has no actual control on fishing pressure.

Supporting information

There is a general lack of data/information on species composition in the catch, volume of trade and biological aspects of the species. The poor data availability is recognized as one of the main hurdles for better management. In October and November 2010, the R/V Dr. Fridtjof Nansen conducted two offshore fisheries resource surveys in Paksitan's waters. These included sampling by acoustics, pelagic trawling, demersal trawling and collected a suite of concurrent biological and physical oceanography observations. Recently the Marine Fisheries Department collaborated with FAO to conduct several missions for the assessment of the marine and brackish-water species considered to be regular components of the catches along Pakistan's coast. The objective was to update the FAO "Field identification guide to the living marine resources of Pakistan" originally published in 1985. These activities resulted in the publication of a new "Field identification guide to the living marine resources of Pakistan" in 2015 where the list of elasmobranch fishes is updated, including 47 species of sharks and 44 species of rays and skates.

Monitoring, Control and Surveillance (MCS) capacity

The weak MCS capacity makes difficult the implementation of the few management measures in place. The enforcement of the fishing closure seems to be effective with the available enforcement capacity (part of the fleet is covered by sea/port inspections) but, as noted above, the measure has only limited value for the sustainable use of sharks. The absence of logbooks and observers makes the catch monitoring reliant almost exclusively on the limited dockside monitoring program in place.

Legal acquisition findings

Legislation

The national legislation for fisheries management includes a few norms that are of relevance to the listed species (Table 35). From the information obtained in the consultation, Pakistan has no specific legislation concerning the harvesting and trade in CITES listed commercially-exploited species. Other than that, the country is required to follow the norms of IOTC for the conservation and management of sharks caught in association with tuna fisheries. According the evaluation conducted by the CITES Secretariat[24], the country legislation does not meet all the minimum requirements for implementation of CITES (Category 2).

Species identification

Recently FAO published the "Field identification guide to the living marine resources of Pakistan", including marine and brackish-water species considered to be regular components of the catches along Pakistan's coast, an updated identification tool to accurately assess, monitor and report fishery catches at the species level. On the other hand, training material and capacity building is needed to identify the products in trade. On this

[24] CoP17 Doc. 22 Annex 3 (Rev. 1) Status of legislative progress for implementing CITES (updated on 1 September 2016).

regard, WWF Pakistan, CITES and FAO collaborated in the organization of a webinar in November 2016 to teach the general methodology for the identification of shark fins through lectures and exercises.

Traceability

Pakistan does not have any traceability mechanism implemented that could assist in the verification of the origin and legality of shark and ray products along the supply chain. The weak MCS system is one of the main limitations in this regard.

Institutional collaboration

The Federal government (Climate Change Division) in collaboration with the provincial and territorial authorities and Pakistan Customs implements CITES in Pakistan. Forestry Wing, Climate Change Division is the focal agency for the implementation of CITES in Pakistan. No specific arrangement exists between the Climate Change Division and the Marine Fisheries Department to facilitate the implementation of the listing of commercially exploited aquatic species. According to Muhammad Khan (Climate Change Division), a meeting was held in the Marine Fisheries Department on 17 April 2014 to discuss an appropriate approach to deal with the new CITES listings of sharks and manta rays and to develop a plan of action before the listings come into effect. As a first step, the Marine Fisheries Department will increase monitoring of fisheries and trade in sharks to assess the total catch of the listed species and the volume of trade. If it is shown that the export of sharks is insignificant the Government of Pakistan, through the Marine Fisheries Department, may consider introducing a ban on the exports of shark fin and other products in trade (M. Khan, pers. comm.). By virtue of its membership, Pakistan has to comply with IOTC Resolutions concerning data reporting and the conservation of sharks caught in association with fisheries managed by IOTC.

Singapore

SUMMARY INFORMATION ON SHARK FISHERIES AND TRADE

Shark fisheries have a minor importance in Singapore. Catches have been particularly low during the last decade, being on average below 200 tonnes per year in recent years (Figure 21). According to the information obtained in the FAO/CITES workshop, none of the species listed are caught by fisheries in Singapore or by Singapore-flagged vessels.

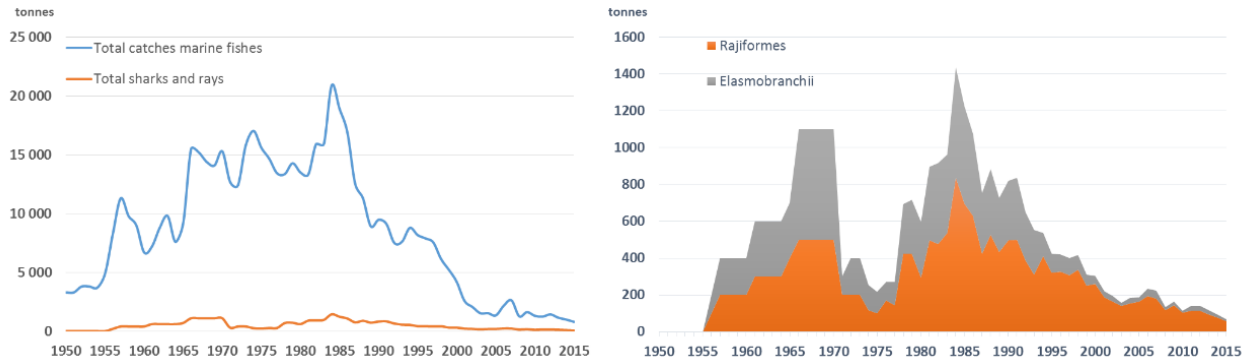

Figure 21. Marine capture fisheries production and the composition of the shark catches of Singapore (Source: FAO, 2017a).

Singapore is, on the other hand, an important node in the trade of shark products. Accordingly, high volumes of export and imports of shark products are reported by Singapore, mainly fins and frozen meat (Table 36). Between 2008 and 2013, Singapore re-exported [Pers.comment Ms Janice Yap (Agri-Food & Veterinary Authority)] an average of 4 000 tonnes of shark products per year, valued at ca. USD 55 million/year (fins accounted for more than half of the export value). This value represented almost 15 percent of the total export value of marine fisheries commodities in the period. Imports of the same magnitude were reported in the period.

Table 36. Average (2008 – 2013) trade flow of shark products from Singapore (FAO, 2016c).

Commodity (average 2008-2013)	Re-export		Import	
	Tonnes	*USD'000*	*Tonnes*	*USD'000*
Rays and skates (Rajidae), fresh or chilled	137	312	483	566
Rays and skates (Rajidae), frozen	1	4	37	101
Shark fins, dried, whether or not salted, etc.	941	24 394	1 013	29 708
Shark fins, prepared or preserved	133	3 343	320	11 844
Sharks nei, fresh or chilled	0	3	32	26
Sharks nei, frozen	2 807	27 304	3 085	26 828
Total shark commodities	**4 020**	**55 360**	**4 969**	**69 075**
Total all marine fisheries commodities	**60 685**	**370 884**	**218 234**	**1 001 913**

ASSESSMENT OF NATIONAL CAPACITY TO IMPLEMENT CITES REQUIREMENTS

Non-detriment findings

Management regime

The Fisheries Act, the Endangered Species (Import and Export) Act and the Wholesome Meat and Fish Act constitute the legal framework for the regulation of harvesting and trade in marine fishery resources, including sharks. The Agri-Food and Veterinary Authority (AVA) is the fisheries authority in Singapore and the institution responsible for the licensing of fishing vessels and engaging with relevant RFMOs to facilitate trade of fishery products and to combat IUU fishing practices. Singapore has no management plan or management measures of relevance to the listed species. The country has not developed an NPOA-Sharks and has not ratified the Port State Measures Agreement. Singapore is a member of SEAFDEC. Considering that none of

the listed species is known to be caught in Singapore, no attempt was made to score the country against the minimum requirements.

Supporting information

There is no data available for these species as they are not caught by the fishing vessels. In general, shark catches are reported in highly aggregated taxonomic categories.

Monitoring, Control and Surveillance (MCS) capacity

Considering that none of the listed species is caught in Singapore, this criteria was not evaluated.

Legal acquisition findings

Legislation

The Fisheries Act, the Endangered Species (Import and Export) Act and the Wholesome Meat and Fish Act include provisions of relevance for the regulation of trade in the listed species of sharks and manta rays. The Agri-Food and Veterinary Authority (AVA) of Singapore regulates the import of sharks and shark products through a licensing scheme. Only licensed fish dealers are allowed to import sharks and shark products. For the shark species listed in CITES, only shipments with proper CITES permits are allowed to be imported or re-exported. According to the evaluation conducted by the CITES Secretariat[25], the country's legislation meets all the minimum requirements for the implementation of CITES (Category 1).

Species identification

There will be a need to correctly identify the species for enforcement cases or imported shipments. The random sampling of specimens from imported shipments could be carried out for species identification, using for instance DNA analysis. The AVA laboratory has the capability to conduct DNA tests to identify CITES-listed sharks. The protocol for DNA testing was used to be specific for the detection of the existing CITES Appendix II shark species, namely great white shark, whale shark and the basking shark. In 2013, the laboratory obtained also reference tissue samples for oceanic whitetip, porbeagle and hammerheads from Dr. Demian Chapman from the School of Marine and Atmospheric Sciences, New York (USA). The laboratory would be exploring combined techniques such as species-specific PCR as well as DNA barcoding for the identification of these species. Even if DNA technology is available, it would be necessary to test the proper protocol to extract genetic materials from processed specimens for laboratory analysis. The relative importance of the trade in processed products is unknown, impeding the assessment of the importance of this issue to Singapore.

Traceability

Tracing the origin and legality of catches is not an issue for Singapore considering that the listed species are not caught in the country. The most important issue for Singapore is to make sure that imports and re-exports of listed species are accompanied by appropriate CITES documentation. The Agri-Food and Veterinary Authority (AVA) of Singapore regulates the import of sharks and shark products through a licensing scheme. Only licensed fish dealers are allowed to import sharks and shark products. For CITES-protected shark species, only shipments with proper CITES permits are allowed to be imported or re-exported. The import and re-export of shark and shark product shipments require declaration via the Singapore Customs' TradeNet system which would be routed to AVA for processing and approval. The country has species-specific customs product codes for CITES-listed sharks and general product codes for non-CITES sharks and rays.

Institutional collaboration

The collaboration between CITES and fisheries authorities in the implementation of the listings is not an issue for Singapore considering that the AVA is the de facto fisheries authority in Singapore and also the national CITES authority responsible for the implementation and enforcement of CITES and wildlife policies. The establishment of a registration system of licensed exporters and a labelling system for processed products at the origin/exporting/processing country are examples of measures that have been suggested by Singapore at the regional consultation to facilitate the enforcement of the CITES listings.

[25] CoP17 Doc. 22 Annex 3 (Rev. 1) Status of legislative progress for implementing CITES (updated on 1 September 2016).

Sri Lanka

SUMMARY INFORMATION ON SHARK FISHERIES AND TRADE

Sharks are exploited by offshore fisheries as well as coastal fisheries in both pelagic and benthic habitats. Offshore fisheries account for the bulk of the shark catches. The main fisheries involved are offshore gillnet fishery, offshore shark longline fishery, offshore tuna longline fishery and deepwater benthic shark fishery (spiny shark fishery). Sharks are also landed as incidental catches in a number of other fisheries such as bottom-set gillnet fishery for skate, bottom-set gillnet fishery, bottom-set longline fishery and beach seine fishery (FAO, 2009). The offshore fisheries are operated by small-scale vessels in the exclusive economic zone and beyond, targeting migratory stocks of tuna, billfish and sharks. Main gears used are large-mesh gillnets and shark/tuna longlines. The fishery has developed since the mid 1980s, with over 2 500 boats operating by the early 2000s. It is estimated that nearly 15 000 fishers are engaged in offshore fisheries (FAO, 2009). About 61 shark species belonging to 5 orders and 17 families have been reported in Sri Lankan fisheries. Oceanic whitetip and hammerheads are among the top shark species caught in the offshore fisheries, representing about 6 percent of the total shark catches (dominated by silky and blue sharks; FAO, 2009). *M. birostris* is less frequently caught in a target seasonal gillnet fishery and also as bycatch. High fishing pressure due to increased demand for mobulid ray gills resulted in a large number of manta and mobula being landed on a daily basis at Sri Lankan fish markets. Mobulid rays are landed regularly at Negombo, Beruwela, Mirissa and Trincomalee landing sites as "target bycatch" of gillnet fisheries primarily targeting skipjack tuna (*Katsuwonus pelamis*) and yellowfin tuna (*Thunnus albacares*) (Fernando *et al*., in preparation). Reported catches reached a peak of about 35 000 tonnes/year in 1999, declining abruptly in the following years, particularly after the tsunami event in 2004 (Figure 22). The average catches in recent years (6 421 tonnes/year) represent ca. 2 percent of the total marine catches of Sri Lanka. Average catches of listed species in the last decade are: silky shark 1941 tonnes/year; devil rays 283 tonnes/year; oceanic whitetip 94 tonnes/year; hammerheads 83 tonnes/year.

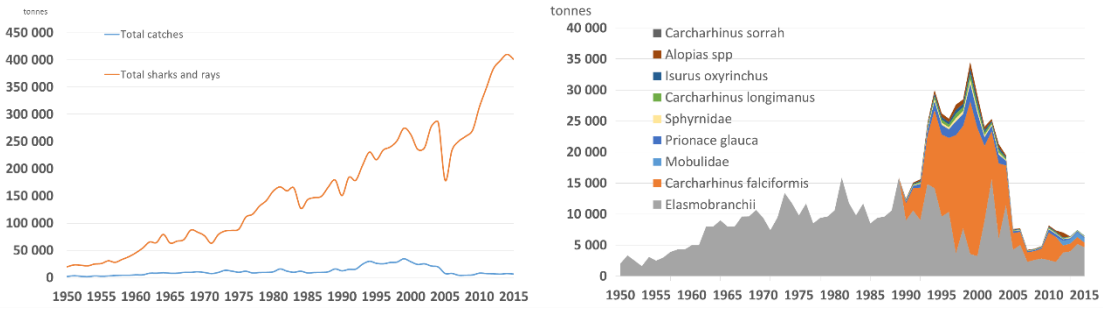

Figure 22. Marine capture fisheries production and the composition of the shark catches of Sri Lanka (Source: FAO, 2017a).

Sharks are fully utilized in Sri Lanka and wastage is minimal. Fresh and dried shark meat are used for local consumption while fins and skin are used for export. Shark meat serves as a cheap source of animal protein and thereby helps the lower income groups in Sri Lanka meet their protein needs. Dried shark meat is particularly popular among the estate populations in the hill-country areas who have limited access to fresh fish. Shark fins are mostly exported to China Hong Kong SAR, the Republic of Korea, The Maldives, Singapore, United States and Taiwan Province of China. Silky shark, oceanic whitetip shark and blue shark are the species that are mainly used for extraction of fins. Fins are dried and exported without much processing or value addition. Dried skin is exported to China to make shoes and belts while shark jaws, teeth and skin are exported to the Maldives.

According to information provided during the consultation, the price of shark fins has declined drastically in recent years following a decline in the global fin trade. According to export statistics submitted by Sri Lanka customs, total shark fin exports in 2012 amounted to 82 544 kg while only 5 520 kg has been exported in 2013 up to June. Data reported to FAO shows only an average of 61 tonnes of shark fins exportes from 2008 to 2013 (Table 37).

Table 37. Average (2008 – 2013) trade flow of shark products from Sri Lanka (FAO, 2016c).

Commodity (average 2008–2013)	Export		Import	
	Tonnes	*USD'000*	*Tonnes*	*USD'000*
Shark fins, dried, whether or not salted, etc.	61	1 389	7	24
Sharks nei, fresh or chilled	1	2	7	6
Sharks nei, frozen	1	3	25	20
Total shark commodities	**63**	**1 394**	**39**	**50**
Total all marine fisheries commodities	**20 665**	**197 905**	**90 441**	**149 012**

ASSESSMENT OF NATIONAL CAPACITY TO IMPLEMENT CITES REQUIREMENTS

Non-detriment findings

Management regime

The Fisheries and Aquatic Resources Act, No. 2 of 1996 (FARA) and its (Amendment) Act, No. 2 of 2016 is the main legal instrument that provides for the management, regulation, conservation and development of fisheries and aquatic resources in Sri Lanka, and gives effect to Sri Lanka's obligations under certain international and regional fisheries agreements. It is implemented by the Fish Catch Data Collection Regulations, 2014, estabiching that every person who uses mechanized fishing boat for fishing in Sri Lanka waters or high seas, shall carry onboard a logbook issued by the Department of Fisheries and Aquatic Resources during each fishing trip. In addition, the High Seas Fishing Operations Regulations No. 1 of 2014 establish a licence system for fishing operations in the high seas. Fisheries (Regulation of Foreign Fishing Boats) Act, No. 59 of 1979 (FFBA) provides for regulation, control and management of fishing activities by foreign boats in Sri Lanka waters and the Fauna and Flora Protection Ordinance (FFPO) establishes the legal framework for the protection of species of wild animals, including mammals, birds, reptiles, amphibians, fishes, invertebrates, and plants. In 2015 Sri Lanka adopted the "Shark Fisheries Management Regulations". These regulations establish the several fishing restrictions specific for sharks (see Table 38). An NPOA-Shark was adopted in 2013. Sri Lanka deposited the accession to the Port State Measures Agreement in 2011, since then the country has not ratified the agreement. Sri Lanka adopted the National Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (SLNPOA-IUU) in 2015. The country is a member of IOTC and of the Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO). Table 38 summarizes the main management measures adopted by Sri Lanka of relevance to sharks.

Table 38. Management measures of relevance to shark fisheries in Sri Lanka. The effectiveness of these measures in addressing the known sources of mortality is noted.

Management measures	Description	Effectiveness
Species prohibitions	No person engaged in fishing operations in Sri Lanka waters shall catch any shark of the following species: species *Alopias vulpinus* (thresher shark), *A. superciliosus* (Big-eye thresher shark), *A. pelagicus* (Pelagic theresher shark), *Carcharhinus Iongimanus* (oceanic whitetip shark) and *R. typus* (whale shark); except for the collection of museum, biological sampling for taxonomic study and research purposes (Shark Fisheries Management Regulations). As a Member of IOTC, Sri Lanka observes the reservation and management measures in place in the IOTC convention area.	**Low-Medium:** Expected some level of reduction in mortality on whitetip and threshers. Measure with no effect on hammerheads and manta rays.
Product form restrictions	No person shall: (i) remove on board a local fishing boat the fins of any shark caught by such local fishing boat and discard the carcass of such shark of which fins have been removed. (ii) retain on board, transship	**Low - Medium.** Regulation can lead to live release of sharks incidentally caught. Incentive to release is low because sharks are

Management measures	Description	Effectiveness
	or land fins of any shark unless such fins are naturally attached to the body of such shark (Shark Fisheries Management Regulations). Prohibited finning in fisheries regulated by IOTC. Required to apply a 5 percent fin-to-body weight ratio for sharks on board vessels up to the first point of landing (Landing of Fish (species of shark and skates) Regulation, 2001).	one of the target species and there is local demand for the meat. Level of post-capture and release mortality unknown.
Participatory restrictions	Only fishers in possession of a valid licence issued under the Fishing Operations Regulations of 1996 (published in gazette Extraordinary No 948/25 of November 07, 1996) may land fish belonging to the species of sharks or skates, moreover those vessels have to be registered under the Department of Fisheries & Aquatic Resources(DFAR).	**Low.** Licensing has negligible effect if not used to limit entry and therefore control the number of vessels participating in the fishery.
Others	The management of fisheries includes community participation (Fisheries & Aquatic Resources amended Act No.35 of 2013). DFAR is in the process of amending the Regulation on high seas fisheries, provisioning fishing vessels to have bycatch mitigation devices such as line cutters. Currently it is stated as a requirement in the high seas fishing operation licence.	**Low.** Community participation in management decisions can increase the level of compliance. However, in the case of Sri Lanka, very few measures have been implemented to manage shark fisheries.

Supporting information

There is a well-established large pelagic fishery data collection programme run by the National Aquatic Resources Research and Development Agency (NARA) since 1994. Species wise shark catch recording was carried out by NARA under the above programme until 2004 when it was decided to lump all the shark catches due to the very low contribution of sharks to the total large pelagic fish production. However, species wise catch reporting was restarted in 2011 in order to comply with the adopted resolutions for sharks by the Indian Ocean Tuna Commission (IOTC). No similar system exists for the coastal fisheries. Statistics are collected by Fishery Inspectors through interviews with fishers and used to estimate the monthly production. Lack of funds and trained human resources were considered the main limitations to the collection of supporting information to manage shark fisheries (FAO, 2009). As noted in FAO (2009) "*Currently NARA has only one scientist, 12 samplers and one data entry operator to cover entirely offshore fisheries. Their main interest is for tuna landings. As there are 14 harbors, 36 anchorages and nearly 600 beach landings at least the staff should be doubled and some should be dedicated to collect shark catch information to obtain scientifically acceptable catch information regarding the fisheries*". The current situation is unknown but likely to be the same. The size distribution in the catches, catch and (possibly) CPUE trends of hammerheads and oceanic whitetip in the offshore fisheries, are the only biological information available on the listed species. None of the listed species has been assessed in Sri Lanka or in the Indian Ocean.

Monitoring, Control and Surveillance (MCS) capacity

Offshore fisheries are covered by logbooks (introduced recently to multi-days boats above 34 feet), dockside monitoring and sea/port inspection (Annex 4). The use of observers on board and VMS has been proposed but is not yet operational. Insufficiency of the field staff and the lack of physical resources such as patrolling boats are some of the issues for fisheries enforcement (Fischer *et al*., 2013). With the present MCS capacity it would be reasonable to assume that regulations concerning the offshore fishery could be enforced. Enforcement is weaker for the inshore sector, which makes a small contribution to the total shark catches. Under the framework of the European Council Regulation (EC) No 1005/2008[26], the EU adopted trade restrictions against Sri Lanka in October 2014 (IP/14/1132) for their lack of commitment to tackling illegal fishing. The restrictions were

26 https://ec.europa.eu/fisheries/

lifted in April 2016 following the adoption of measures to address the deficiencies in their fisheries management systems.

Legal acquisition findings

Legislation

The Fisheries and Aquatic Resources Act, No. 2 of 1996 (FARA) and its (Amendment) Act, No. 2 of 2016 is the main legal instrument that provides for the management, regulation, conservation and development of fisheries and aquatic resources in Sri Lanka, and gives effect to Sri Lanka's obligations under certain international and regional fisheries agreements. It is implemented by the Fish Catch Data Collection Regulations, 2014, establishing that every person who uses mechanized fishing boats for fishing in Sri Lanka's waters or high seas, shall carry onboard a logbook issued by the Department of Fisheries and Aquatic Resources during each fishing trip. In addition, the High Seas Fishing Operations Regulations No. 1 of 2014 establish a licence system for the for fishing operations in the high Seas. In 2015 Sri Lanka adopter the "Shark Fisheries Management Regulations". These regulations establish the several fishing restrictions specific for sharks (Table 38)

Other two relevant laws are: i) the Fisheries (Regulation of Foreign Fishing Boats) Act, No. 59 of 1979 (FFBA), which provides for regulation, control and management of fishing activities by foreign boats in Sri Lankan waters; ii) the Fauna and Flora Protection Ordinance (FFPO; amended by the Fauna and Flora Protection (Amendment) Act, 2009 (Act No. 22 of 2009)), which establishes the legal framework for the protection of species of wild fauna and flora. No species of sharks are currently listed as protected species in the FFPO.

As a member of IOTC, Sri Lanka has also to comply with the specific regulations established for sharks (see Table 38). According to the evaluation conducted by the CITES Secretariat[27], the country's legislation does not meet the minimum requirements for the implementation of CITES (Category 3).

Species identification

The taxonomy of sharks, rays and skates found in Sri Lankan waters has received relatively little attention in the past (FAO, 2009). It is suspected for instance that many species of rays remain to be documented. Despite that, the country has a relatively good system of collection of shark catch statistics in the offshore fisheries, with disaggregated catch records for the main species in the catch, including hammerheads and oceanic whitetip. Some level of capacity to identify species in the catches is therefore available. Awareness programs have been planned to be conducted for stakeholders to identify shark species and the preparation of identification guides has been proposed in the NPOA sharks. A workshop organised in 2014 by the Pew Charitable Trusts for implementing the CITES Shark Appendix II was held in Colombo and the participants were trained on how to identify shark fins. Recently, the "Field Guide to the Identification of mobulid rays (Mobulidae): Indo-West Pacific" published by Manta Trust in 2016 was based on the experience of the researchers who worked at several landing sites in Sri Lanka.

Traceability

A catch certification system is in place for fishery products exported to the EU (following the requirements and standards established by the European Council Regulation (EC) No. 1005/2008). The system is currently mainly operated for tuna and billfish species. Given the existing capacity, the establishment of similar controls for sharks caught in the offshore fisheries should not be a major challenge.

[27] CoP17 Doc. 22 Annex 3 (Rev. 1) Status of legislative progress for implementing CITES (updated on 1 September 2016).

Institutional collaboration

The Department of Fisheries and Aquatic Resources (DFAR) has the overall mandate for the implementation of the provisions incorporated in the Fisheries and Aquatic Resources Act. The Department of Wildlife Conservation (DWLC) administers the Fauna and Flora Protection Ordinance (FFPO), which establishes the legal framework for the protection of species of wild fauna and flora in Sri Lanka. DWLC is the focal point and competent authority in Sri Lanka for CITES, and implements provisions of CITES. According to the information provided in the consultation, DWLC has been working closely with DFAR in matters concerning export of CITES-listed aquatic species.

Following a warning by the EU, Sri Lanka was listed as a non-cooperating third country in 2015. However, in 2016, the EU lifted the red card and associated trade measures off Sri Lanka, as the country had significantly improved its national fisheries governance, amending its legal framework, strengthening the sanctions and improving its fleet control.

Recognizing the importance of regional cooperation in the management of shark fisheries, the following activities have been proposed under the NPOA Sharks in preparation:

- Seeking for means through international agreements to establish cooperative research, stock assessments, conservation and management initiatives for trans-boundary, straddling, highly migratory and high-seas shark stocks and promote development and implementation of a regional plan of action for the conservation and management of sharks (RPOA – sharks), in collaboration with the BOBLME Project and the BOBP-IGO.

- Prompt analysis of data and publishing results in a timely manner in an understandable format, and making the reports available for peer review.

- Seeking for international assistance and resources to enhance national capacities to further develop and implement NPOA – Sharks.

A Shark Working Group has been established under the BOBLME Project with the objective to facilitate cooperation and partnership among fisheries agencies of the participating countries (Bangladesh, India, Indonesia, Malaysia, Maldives, Myanmar, Sri Lanka, and Thailand). The organization is also working towards the establishment of a Regional Plan of Action for Sharks.

As a member of the IOTC Sri Lanka has the responsibility of providing required data to implement conservation and management measures. Sri Lanka provides catch and effort data of shark fisheries to IOTC annually.

Taiwan Province of China

SUMMARY INFORMATION ON SHARK FISHERIES AND TRADE

According to the data reported to FAO, in recent years. Taiwan Province of China landed an average of 1027 tonnes/years of silky shark, 346 tonnes/year of hammerhead sharks, 690 tonnes/year of thresher sharks and 164 tonnes/year of oceanic whitetip sharks. There is no data on the other species. The bulk of the sharks catches are reported in highly aggregated taxonomic categories. The highest catches of sharks and rays (75 731 tonnes/year) were recorded in 1990. Since then there is a general declining trend in catches. The group account for about 4 percent of the total marine fisheries production in recent years (Figure 23).

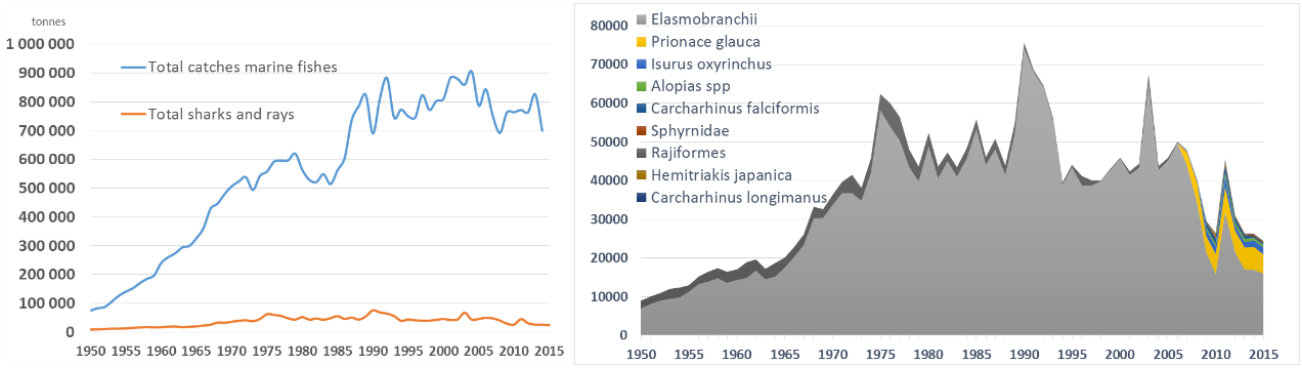

Figure 23. Marine capture fisheries production and the composition of the shark catches of Taiwan PC (Source: FAO, 2017a).

No information could be obtained on the uses and trade in the listed species of sharks and manta rays. Table 39 summarizes the trade data reported to FAO. Considerable volumes of shark fins and meat are exported from and imported to Taiwan Province of China. The total export in shark products is valued at USD 40. 5 million/year, representing a small percentage (2.2 percent) of the total trade in marine fisheries commodities from Taiwan Province of China.

Table 39. Average (2008 – 2013) trade flow of shark products from Taiwan Province of China (FAO, 2016c).

Commodity (average 2008-2013)	Export		Import	
	Tonnes	USD'000	Tonnes	USD'000
Shark fillets nei, frozen	2111.0	4868.5	532.7	285.2
Shark fillets, fresh or chilled	0.0	0.0		
Shark fins, dried, unsalted	422.5	5147.8	145.8	6584.8
Shark fins, dried, whether or not salted, etc.	26.0	290.0	12.0	539.0
Shark fins, fresh or chilled	1.2	5.0	3.0	13.2
Shark fins, frozen	309.0	2666.8	820.2	2609.5
Shark fins, prepared or preserved	79.0	1020.3	1.5	19.8
Shark fins, salted and in brine but not dried or smoked	0.2	0.5	0.0	0.2
Sharks nei, fresh or chilled	0.0	0.0	0.2	0.8
Sharks nei, frozen	21791.3	26582.8	2968.8	1357.7
Total sharks commodities	**24 740**	**40 582**	**4 484**	**11 410**
Total all marine fisheries commodities	**634 458**	**1 815 318**	**152 711**	**346 683**

ASSESSMENT OF NATIONAL CAPACITY TO IMPLEMENT CITES REQUIREMENTS

Non-detriment findings

Management regime

Fisheries are regulated under the Domestic Fisheries Act and Wildlife Conservation Act (1929, last amendment 2015). The Act deals with entry controls, technical measures, MCS and enforcement schemes and recreational fisheries and it is implemented by numerous regulations. Since 2012, Taiwan Province of China adopted the

"Directions on the Disposal of the Fins of the Shark Catches of Fishing Vessels" aiming to promote the measure of "shark's fins naturally attached to bodies". In 2016, Taiwan Province of China adopted the "Act for Distant Water Fisheries", with the purpose of ensuring the conservation of marine fisheries resources, strengthen distant water fisheries management, curb illegal, unreported, and unregulated (IUU) fishing, and improve traceability of catches and fisheries products, so as to promote the sustainable operation of distant water fisheries. The NPOA-Shark was adopted in 2006. It includes four commitments: to monitoring shark fisheries via VMS; to introducing a fin-to-body weight ratio; to reduce fishing effort or introducing TAC-based management for declining species; and to promote the full utilization of sharks. Taiwan Province of China is a member of CCSBT, IOTC, WCPFC and ICCAT. The CCSBT has no specific shark conservation measure, but encourages its member countries to comply with shark measures adopted by the IOTC, WCPFC and ICCAT in their Convention Areas. From the information available it seems that the banning of finning is the only specific measures that would be of relevance to the listed species of sharks.

Supporting information

Catches of many listed species are reported at specific (whitetip) and at family level (hammerheads and threshers). Others are reported in highly aggregated categories that have no use for the monitoring of the status of the stocks. According to Fisher *et al*. (2012), stock assessments exist for a few pelagic species, including *S. lewini*, but no further information could be obtained about this stock assessment. Simpfendorfer *et al*. (2005, *apud* Fisher *et al*., 2012) reports that Taiwan Province of China has strengthened shark research since 1995 and that in 2001 an observer programme was initiated to record the shark bycatch of far seas vessels.

Monitoring, Control and Surveillance (MCS) capacity

No information could be obtained to assess this criterion.

Legal acquisition findings

Legislation

As mentioned above, fisheries are regulated under the Domestic Fisheries Act and Wildlife Conservation Act (1929, last amendment 2015). The Act deals with entry controls, technical measures, MCS and enforcement schemes and recreational fisheries and it is implemented by numerous Regulations. The only shark specific regulation has been in place since 2012, the "Directions on the Disposal of the Fins of the Shark Catches of Fishing Vessels" aiming to promote the measure of "shark's fins naturally attached to bodies". In 2016, Taiwan adopted the "Act for Distant Water Fisheries".

Species identification

In the period from 2010–2012, the DNA barcoding method was applied to identify the species of shark landings at fishing ports, shark fin products in retail stores, and shark fins detained by customs from Taiwan Province of China. From landing sites 23 species were identifies, and the more abundat were blue shark, silky shark, bygeye thresher and pelagic thresher sharks. In 2013, the DNA barcoding method was applied to the shark flesh in the markets of Taiwan Province of China to identify the species composition and the CITES listed species. From the meat 20 species were identified and the 80 percent of the sample were constituted of four species: pelagic thresher shark, silky shark, shortfin mako and blue shark, and *Prionace glauca*, indicating that these species might be heavily consumed in Taiwan Province of China.

Traceability

No information could be obtained to assess this criterion

Institutional collaboration

The Shark Research Center of the National Taiwan Ocean University, and the National Kaohsiung Marine University are the local Institutions conducting shark research.

Thailand

SUMMARY INFORMATION ON SHARK FISHERIES AND TRADE

Although there is no targeted fishery for sharks in Thailand, large quantities of sharks are caught as bycatch in a variety of fisheries, the majority in trawling fisheries. In the Andaman Sea, for instance, 97 percent of sharks were taken as bycatch in otter board trawls (BOBLME, 2011). Thailand reports shark catches in highly aggregated categories and it is impossible to know the catches of the listed species. Over 80 species of sharks and rays have been identified in Thai waters. There are no records of manta ray and porbeagle in Thai waters. A survey conducted in fishing ports in 2011/2012 showed that of the listed species, only the scalloped hammerhead, *S. lewini*, is caught in small quantities (<1 percent of the shark catches); *S. mokarran*, *S. zygaena* and *C. longimanus* are rarely caught. Reported catches reached a peak of 32 540 tonnes/year in 2003, declining in the following years in parallel to a general decline in Thai marine catches. The average catch of sharks in recent years is 9 360 tonnes/year, representing less than 0.6 percent of the total marine catches (Figure 24).

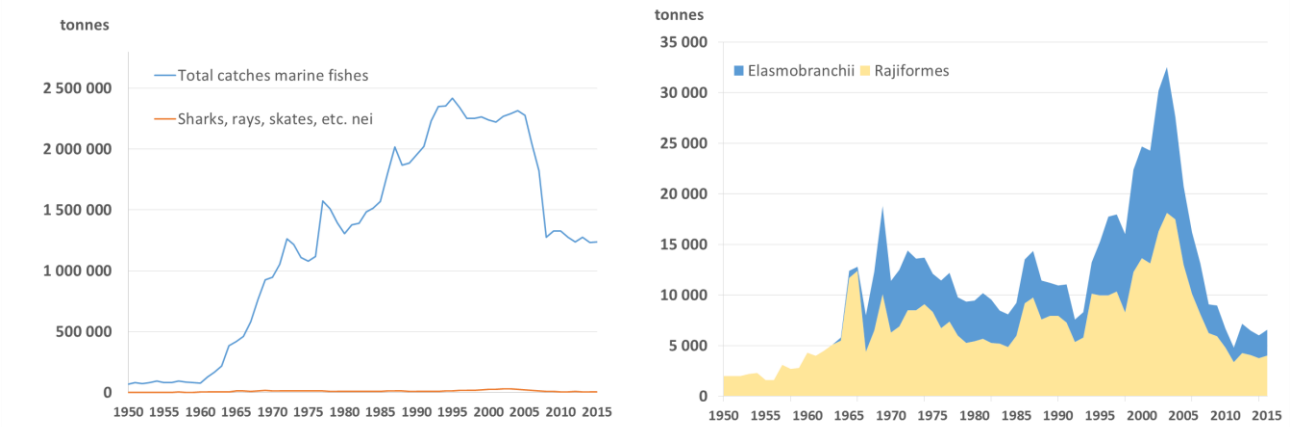

Figure 24. Marine capture fisheries production and the composition of the shark catches of Thailand (Source: FAO, 2017a).

Sharks are fully utilized in Thailand. The meat is consumed in fresh or processed products such as fish balls and dried salt fish. The fins are consumed locally and exported. Jaws and teeth are used to make souvenirs. Skin, liver, head are also consumed locally. According to trade data reported to FAO, Thailand exported an average of 5 643 tonnes of fins per year from 2008 to 2013, valued at about USD 28 million (Table 40). Thailand has surpassed China, Hong Kong SAR as the world's largest exporter. In contrast to the large high-value fins traded through China, Hong Kong SAR and Singapore, markets in Thailand, Malaysia and Japan are known to focus on small low-value fins and there is the suspect that the fins exported are artificial (Dent and Clarke, 2015). Frozen sharks are also an import trade item according to this data. There are no species-specific trade data, but according to the information obtained in the consultation, the exports of the listed species is probably negligible, giving their low frequency in the catches and the local consumption.

Table 40. Average (2008 – 2013) trade flow of shark products from Thailand (FAO, 2016c).

Commodity (average 2008-2013)	Export		Import	
	Tonnes	*USD'000*	*Tonnes*	*USD'000*
Rays and skates (Rajidae), fresh or chilled	2	3	0	1
Rays and skates (Rajidae), frozen	10	19	42	39
Shark fins, dried, whether or not salted, etc.	17	566	55	677
Shark fins, prepared or preserved	5 643	28 057	22	135
Sharks nei, fresh or chilled	36	55	0	0
Sharks nei, frozen	595	994	512	1 345
Total shark commodities	**6 302**	**29 693**	**631**	**2 196**
Total all marine fisheries commodities	**1 748 985**	**7 222 481**	**1 617 489**	**2 650 384**

Non-detriment findings

Management regime

Since 2015, the management and development of any fisheries in Thailand fell under the The Fisheries Act, B.E, 2558 (updated in 2015), laying down the general principles relating to fisheries. This act was then repealed by the Royal Ordinance on Fisheries, B.E. 2558 (2015) aiming to reorganize fisheries in Thailand. It is implemented by 38 Announcements of the Department of Fisheries released in 2015 and 2016, some of them can be relavant in the context of this document: Announcement of the Department of Fisheries determining rules and procedures for installing and maintaining fishing vessel tracking systems on board of commercial fishing vessels; Announcement of the Department of Fisheries on fishing logbooks, and timing and other matters regarding electronic notification of fishing data; Announcement of the Department of Fisheries determining the criteria for the provision of regular observers on fishing vessels licensed to fish outside Thai waters. Moreover, Thailand adopted the Marine Fisheries Management Plan of Thailand, a National Policy for Marine Fisheries Management, 2015 - 2019. The Plan sets out a formal harvest strategy for the fishery sector and provides direction for the formulation of management actions within the context of the Fisheries Act, 2002 and Fisheries Regulations, 2010. A first NPOA-Sharks was developed by the Department of Fisheries in 2005, but never fully implemented and a second NPOA-sharks drafted in 2014 is currently under revision. The whale shark *R. typus* is protected by the Ministerial Proclamation, 28 March 2000. Only the planned activities concerning data collection and analysis were implemented until now. Thailand has developed an NPOA-IUU. The country is a member of APFIC, IOTC, SEAFDEC and a Cooperating Non–member of WCPFC. Table 41 summarizes the measures of relevance for shark fisheries in Thailand.

Table 41. Management measures of relevance to shark fisheries in Thailand. The effectiveness of these measures in addressing the known sources of mortality is noted.

Management measures	Description	Effectiveness
Species prohibitions	The whale shark (*Rhincondon typus*) protected in Thailand with a ban on whale shark fishing within Thai Waters (Ministerial Proclamation of The Ministry of Agriculture and Cooperatives dated 28 March, 2000); IOTC: i) thresher sharks (*Alopias* spp.) not to be retained and to be released unharmed, to the extent practicable, when caught in association to IOTC regulated fisheries (Resolution IOTC 12/09 2012); ii) oceanic whitetip shark (*C. longimanus*) not to be retained and to be released unharmed, to the extent practicable, when caught in association to IOTC regulated fisheries (Resolution IOTC 13/06 2013); iii) prohibition of setting a purse seine net around a whale shark (*R. typus*), in the IOTC area of competence. (Resolution IOTC 13/05 2015). WCPFC: i) retaining onboard, transshipping, storing on a fishing vessel, or landing any oceanic whitetip and silky shark (CMM 2011-04; CMM 2013-08); ii) prohibition from setting a purse seine on a school of tuna associated with a whale shark (CMM 2012-04).	**Low:** No effect on bottom trawling fisheries, which are the most important fisheries catching sharks in Thailand.
Product form restrictions	Prohibited finning in fisheries regulated by IOTC and WCPFC. Required to apply a 5 percent fin-to-body	**Low.** Regulation with no effect on trawl fisheries.

Management measures	Description	Effectiveness
	weight ratio for sharks on board vessels up to the first point of landing.	
Spatial restrictions	Prohibited fishing by trawlers and push netters within a distance of 3-5.4 km from the shoreline and within a perimeter of 400 m of any stationary gear through the year. MPAs where all types of fisheries are banned: Aquatic sanctuaries; National Marine Park; Mangrove swamps; Coral reefs areas; Sea grass bed; Environmental protection area. Thailand has 16 designated National Marine Parks, covering a total area of 5,154 km2 (average size 322 km2). The total area under protection represents over 2 percent of the shelf area.	**Low – Medium.** Overall there is a substantial portion of the shelf were trawl fisheries are forbidden. The coastal strip can protect nursery areas for hammerheads. The MPAs are of relative small size and have a limited effect for migratory species.
Temporal restrictions	Closed season of 3 months: 15 Feb–15 May in the Gulf of Thailand (cover the area 26,400 km2) and 1 Apr-30 Jun in the Andaman Sea (cover the area 4,696 km2).	**Low.** Decrease in fishing pressure during closure can be offset by reallocation of effort in time. It is unknown if closure coincides with reproductive period of the listed species.
Participatory restrictions	Required fishing licence and boat registration for all types of fisheries.	**Low.** Licensing has negligible effect if not used to limit entry and therefore control the number of vessels participating in the fishery.
Limits to fishing capacity	Freeze of trawling fleet since 1996.	**Low - Medium.** Measure can put a cap on the total fishing pressure on target and bycatch resources.

Supporting information

Shark-related biological, fishery statistical and trade data are lacking and currently no shark assessments are being carried out. Catch data are highly aggregated and cannot be used to evaluate trends in the listed species. A project conducted in 2004, with the financial assistance of SEAFDEC, collected data on shark biology, fisheries and utilization in the Gulf of Thailand and the Andaman Sea (BOBLME, 2011). No biological data on the listed species was produced. The landing port surveys conducted by the Department of fisheries between June 2011 and May 2012 generated some limited information on the size composition of *S. lewini* in the catch. This seems to be the only available biological data for the listed species.

Monitoring, Control and Surveillance (MCS) capacity

The industrial trawling fleet is covered by logbooks, dockside enumerators and is also subjected to inspections at landing sites. Describing the use of logbooks in the estimation of catches, Stobberup (in prep.) noted some important limitations of the logbook system: "enumerators fill out the respective logbook form by interviewing the owner/fishing master. This does not necessarily take place at the landing site and can consist of monthly

visits to the vessels owners to record monthly data. If data is lacking, other sources of data such as fish sale tickets are used (records of fish landing by fish traders, brokers, Fish Marketing Organizations, Fishermen's Cooperatives)". It was also noted that only ten out of the 24 coastal provinces have a full time enumerator staff employed. In other provinces, staff from the Administrative section conducts survey activities on a part-time basis and assists enumerators when required. Considering the types of regulations in place for sharks, the main weakness of the MCS system is the lack of means to verify the compliance of the vessels with the spatial restrictions, which would require VMS, observers or some means of sea patrolling.

Legal acquisition findings

Legislation

As mentioned above the Royal Ordinance on Fisheries, B.E. 2558 was adopted in 2015 with the aim to reorganize fisheries in Thailand. It is implemented by 38 Announcements of the Department of Fisheries released in 2015 and 2016. The Marine Fisheries Management Plan of Thailand, a National Policy for Marine Fisheries Management (2015 – 2019) sets out a formal harvest strategy for the fishery sector and provides direction for the formulation of management actions within the context of the Fisheries Act, 2002 and Fisheries Regulations, 2010. A second NPOA-sharks was drafted and currently under revision. The banning of fishing for whale shark *R. typus* by the Ministerial Proclamation (28 March 2000) is the only specific measure at the moment. As member of APFIC, IOTC, SEAFDEC and a Cooperating Non–member of WCPFC, Thai vessels observe the reservation and management measures for sharks of these organizations. According the evaluation conducted by the CITES Secretariat[28], the country legislation meets the minimum requirements for implementation of CITES (Category 1).

Species identification

Identification sheets, posters and field guides were produced between 2005 and 2013. In addition, two training workshops on shark and ray identification for government officials were held between 2011 and 2013. From September 2012 to August 2014, The Department of Fisheries signed a Letter of Agreement with the FAO as part of the work under the Bay of Bengal Large Marine Ecosystem (BOBLME). Under this project a detailed field guide in Thai was prepared to facilitate the identification of different species of rays and a checklist of the Batoid fishes in Thailand was produced. The department of Fisheries published two posters for the identification of sharks and rays found in Thai waters (see Annex 5). The country lacks tools and techniques for the identification of products in trade (fins, meat, etc.).

Traceability

A catch certificate system is in place, and apparently covers the catches of industrial trawlers. According to T. Krajangdara (DoF, pers. comm.) when a vessels goes to the dock for landing, the boat register, the gear permit and the logbook showing the amount of fish and the fishing area is presented to an inspection officer. The officer will sign name in logbook and issue movement document to transfer catch to factories. The officer will check the whole process before issuing a catch certificate. In spite of the limitations of the logbook system (see MSC section above), the catch certification provides some means to verify the origin and legality of catches (including of sharks), being able for instance to verify if catches originates from a licensed vessel and during a period when the fishery was open. On the other hand, the area of fishing cannot be properly verified because of the lack of observers and VMS.

Institutional collaboration

No information could be obtained on inter-agency collaboration with regards to the implementation of the listings of shark and manta rays. Nonetheless, the Fisheries Resources Conservation Division, Department of Fisheries, is recognized as the CITES Management and Scientific Authority for fish and other aquatic fauna.

Thailand actively participates of regional initiatives towards the conservation and sustainable use of fisheries resources (including sharks) organised for instance by SEAFDEC and BOBLME. A Shark Working Group has been established under the BOBLME Project with the objective to facilitate cooperation and partnership

[28] CoP17 Doc. 22 Annex 3 (Rev. 1) Status of legislative progress for implementing CITES (updated on 1 September 2016).

among fisheries agencies of the participating countries (Bangladesh, India, Indonesia, Malaysia, Maldives, Myanmar, Sri Lanka, and Thailand). The organization is also working towards the establishment of a Regional Plan of Action for Sharks. Under the auspices of SEAFDEC, Thailand and Myanmar have recently agreed on the establishment of Collaborative Action Plan for Fisheries Management around the North Andaman Sea/Myeik Archipelago. This plan is expected to identify joint approaches that could be adapted for the management of fisheries habitat, trans-boundary stocks, and fishing capacity, as well as for combating illegal and destructive fishing in the area.

The United Arab Emirates

SUMMARY INFORMATION ON SHARK FISHERIES AND TRADE

No information could be obtained on the shark fisheries of the United Arab Emirates. All the catches of sharks and ray are reported in a highly aggregated category. They started to be recorded in mid-1980s, reached a peak of 3 520 tonnes/year in 2005, declining after that. The average catches in recent years (1 152 tonnes/year) represent about 1.5 percent of the total reported marine capture fisheries production (Figure 25).

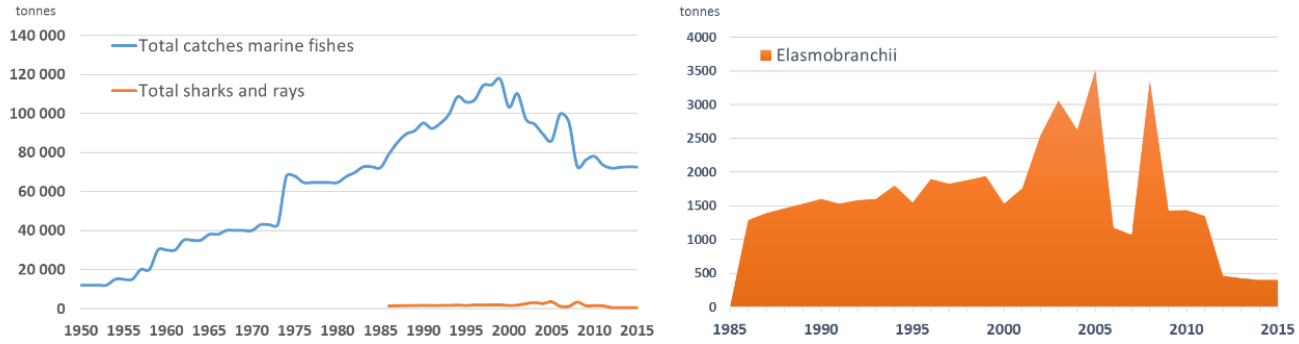

Figure 25. Marine capture fisheries production and the composition of the shark catches of the United Arab Emirates (Source: FAO, 2017a).

Dent and Clarke (2015) report the United Arab Emirates as a major exporter and regional trader of shark fins, with a minimal domestic market and low shark captures. It exports almost entirely dried shark fins, mainly to China, Hong Kong SAR. FAO data indicate that the country exported substantial amounts of fins (dried, salted) from 2008 – 2013 (ca. 427 tonnes/year), valued at USD 13.6 million/year. Owing to a lack of available data, the extent to which the United Arab Emirates imports shark fins from other regional producers is unknown, although the large discrepancy between export and production volumes suggests that the United Arab Emirates is importing from other countries in the region and/or underreporting production.

Table 42. Average (2008 – 2013) trade flow of shark products from the United Arab Emirates (FAO, 2016c).

Commodity (average 2008-2013)	Export		Import	
	Tonnes	USD'000	Tonnes	USD'000
Rays and skates (Rajidae), fresh or chilled			5	15
Rays and skates (Rajidae), frozen			0	3
Shark fillets nei, frozen			5	9
Shark fins, dried, unsalted	0	0		
Shark fins, dried, whether or not salted, etc.	427	13 635	4	24
Shark fins, frozen			6	252
Shark fins, salted and in brine but not dried or smoked			0	0
Sharks nei, fresh or chilled	35	159	100	137
Sharks nei, frozen	9	24	21	84
Sharks, fillets, dried, salted or in brine			13	40
Total sharks commodities	**471**	**13 818**	**152**	**562**
Total all marine fisheries commodities	**26 814**	**91 008**	**123 405**	**403 152**

No information could be obtained on the uses and trade in the listed species of sharks and manta rays. It is worth noting that imports in the same period were almost insignificant and catches were in the order of 1 413 tonnes/years (for comparative reasons, this catch volume would be roughly equivalent to a production of less than 80 tonnes of fins per year (assuming a 5 percent fin-body weight ration)). Thus some level of unreported catches or trade is likely to occur. It can also be concluded from the data in Table 42 that the trade in shark products represent an important share of the total trade in marine fisheries commodities (ca. 15 percent of trade value).

ASSESSMENT OF NATIONAL CAPACITY TO IMPLEMENT CITES REQUIREMENTS

Non-detriment findings

Management regime

Shark fisheries in the United Arab Emirates is regulated by Ministerial Decrees No. 500 (updated to 2014) On Regulating the Fishing and Trading of Sharks Setting licence, gear, areas and period restrictions. Moreover, finning is prohibited and it is prohibited to trade in live sharks captured in the country's fishing waters without a special permit issued by the Ministry. It is prohibited to fish shark species set out in the Appendices of the CITES Convention, a fisherman who accidentally captures any of these species shall release them again into the sea and take necessary measures to protect them and ensure their survival. The same decree regutates the import and export of sharks, setting the certificate scheme adn indicating that in case of re-exports of the specimens from shark species listed in the CITES Appendices, additional documents shall be provided. Moreover the re-export of shark fins is prohibited. The United Arab Emirates is member of the RECOFI, requiring a minimum data reporting of sharks and rays. See the table 43 for more details.

Table 43. Management measures of relevance to shark fisheries in the United Arab Emirates. The effectiveness of these measures in addressing the known sources of mortality is noted.

Management measures	Description	Effectiveness
Species prohibitions	Prohibited fishing of all shark species listed on CITES and occuring in the United Arab Emirates waters which includes all three species of hammerhead sharks (*Sphyrna* spp.), both species of manta Rays (*Manta* sp.), the oceanic white tip shark (*C. longimanus*), sawfishes (*Pristidae* sp.) and the whale shark (*R. typus*) (Ministerial Decrees No. 500, 2014)	**Medium**: Measure can reduce mortality in direct fisheries (relative importance compared to bycatch fisheries is unknown)
Gear restrictions	Only registered dhows (lansh) allowed to fish for sharks with the number of hooks used per dhow not exceeding 100 per gear; the hooks should be circle hooks and do not exceed 0/14 in size; the hooks should not be stainless steel; and that the fishing gear carries the boat number and Emirate code. Other gear such as trawls, explosives and monofilament nylon nets are banned; gill nets are banned from the first of May to mid-October yearly; and there are strict regulations on the mesh sizes that can be used based on gear.	**Low:** Measure can put limit on the maximum fishing effort.

Management measures	Description	Effectiveness
Spatial and temporary restrictions	Sharks fishing is limited to fishing waters that are at a distance not less than 5 NM from the country's shoreline and 3 NM from the country's islands. Furthermore, the United Arab Emirates has 11 Marine Protected Areas where fishing is banned or regulated. The fishing of sharks is banned from the first of February till the end of June every year.	**Low**: Some level of protection for coastal species that use shallow waters as nusrsey areas; not effective for highly migratory species.
Product form restrictions	Finning is prohibited in the United Arab Emirates waters and shark specimens need to be landed as a whole. The fishing of all CITES-listed species is banned. Companies may not export sharks whether fresh, frozen, dried, salted, smoked, canned, or in any form throughout the year. Imported sharks, whether fresh, frozen, dried, salted, smoked, canned or in any other form, may be re-exported provided that the exporter receives a re-export permit from the Ministry of Climate Change and Environment after submitting a series of verification documents.	**Low - Medium.** Regulation can lead to live release of sharks incidentally caught.

Supporting information

No information could be obtained to assess this criterion.

Monitoring, Control and Surveillance (MCS) capacity

No information could be obtained to assess this criterion.

Legal acquisition findings

Legislation

As indicated above, shark fisheries in the United Arab Emirates is regulated by Ministerial Decrees No. 500 (updated to 2014). According the evaluation conducted by the CITES Secretariat[29], the country legislation meets the minimum requirements for implementation of CITES (Category 1).

Species identification

In occasion of training activities organised in the Gulf in 2013, the IFAW's Wildlife Trade Programme produced a poster as illustrated guide to the sharks of the Arabian Gulf which summarizes a list of shark species in the region.

Traceability

No information could be obtained to assess this criterion.

[29] CoP17 Doc. 22 Annex 3 (Rev. 1) Status of legislative progress for implementing CITES (updated on 1 September 2016).

Institutional collaboration

No information could be obtained on inter-agency collaboration with regards to the implementation of the listings of shark and manta rays. Nonetheless, Since the listings of sharks in CITES, the United Arab Emirates Ministry of Environment & Water started cooperating with the International Fund for Animal Welfare (IFAW), Wildlife Trade Programme, on capacity building activities of fisheries officials on the different international agreement of relevance to sharks and specifically on the CITES requirements for exporting listed species of sharks.

Yemen

SUMMARY INFORMATION ON SHARK FISHERIES AND TRADE

Sharks are part of the catch of traditional small-scale gillnet, longline and hook-and-line fisheries. Sharks are also caught as bycatch in industrial bottom trawling fisheries operated by foreing vessels from China, the Republic of Korea, Egypt and Thailand. The actual catch volume in each of these fisheries is unknown. Shaher (2007) noted that the expansion of the artisanal sector during the 1990s (the number of fishers and boats doubled from 1990 to 1999) and the intensification of bottom trawling led to an increase in fishing pressure on sharks since 1990 (Figure 26). There are no species-specific catch data available to evaluate the relative importance of the listed species. Around 62 species of sharks, rays and chimaeras are found in Yemen territorial waters. Shaher (2007) identified about 20 species of Carcharhinidae (including oceanic whitetip) and two species of hammerheads (scalloped and great hammerhead) among the main species of sharks landed by artisanal fisheries. The same study did not report any catches of manta rays or porbeagle in Yemen fisheries. Reported catches of sharks and rays have been increasing since the early 1990s (Figure 26). Recent catches are in the order of 10 295 tonnes/year, accounting for about 6 percent of the national marine catches.

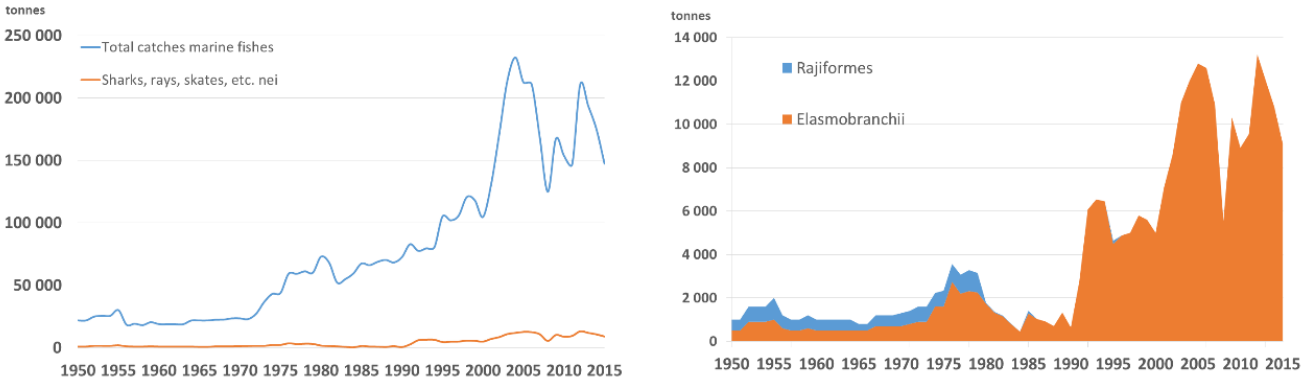

Figure 26. Marine capture fisheries production and the composition of the shark catches of Yemen (Source: FAO, 2017a).

Shark fins trade in Yemen showed a remarkable and rapid increase during the 1990s and 2000s dues to the high demand and price of shark fins (ex-vessel price for dry fins reached 60 USD per kg in the period; Shaher, 2007). In addition to fins, the dry meat of sharks found to be marketable in the local markets and in the regional Gulf of Aden. Nowadays a large population in Yemen depends on dried shark meat as a daily main meal, especially in coastal developed areas. Living conditions for locals do not allow them to buy a variety of other fish species. The demand is also increasing because of the population increase. According to available estimates, 72 percent of the shark catches are consumed locally while 28 percent are exported. Fins, jaws, skin, and bones are exported to many countries such as China, Hong Kong SAR, mainland China, Sri Lanka and Singapore. A significant volume of fins were exported in recent years (302 tonnes/year), contributing to about 4 percent of the total value of marine fishery commodities exported from Yemen (Table 44).

Table 44. Average (2008–2013) trade flow of shark products from Yemen (FAO, 2016c).

Commodity (average 2008-2013)	Export		Import	
	Tonnes	USD'000	Tonnes	USD'000
Shark fins, dried, whether or not salted, etc.	302	8 888		
Sharks nei, fresh or chilled	120	288	7	8
Sharks nei, frozen	137	233	0	1
Total sharks commodities	**559**	**9 409**	**8**	**9**
Total all marine fisheries commodities	**115 782**	**223 503**	**13 715**	**16 694**

ASSESSMENT OF NATIONAL CAPACITY TO IMPLEMENT CITES REQUIREMENTS

Non-detriment findings

Management regime

Yemen's fisheries are regulated within the framework of Law No.2/ 2006 for the Regulation, Conservation and Exploitation of the Marine Organisms. It is implemented by the Resolution of Prime Minister No. 296 of 2006 Regarding Executive Regulations for Law No. 2 of 2006 Concerning Organization and Exploitation of Acquatic Organisms and their Protection 2006-12-25. Regulations (or by-laws) set out the details concerning fishing activities and restrictions including entry controls, technical measures and MCS. In addition, the National Fisheries Strategy (2012-2025), entered into force in 2012, is a multi-sectoral document with a coherent approach integrating the resource, environment, livelihoods, economic and research concerns as well as identifying the priority needs to generate synergetic benefits for enhancing fisheries sector utilization. The international trade in CITES-listed sharks is regulated by the resolution of the Ministers council No. 104 of 2002, which is the national legislation of CITES in Yemen. Yemen entered a reservation to the listing of hammerheads in Appendix II. While the reservation is in effect, the country is formally treated as a non-Party with respect to trade in these species and therefore not required to emit CITES permits and certificates. Yemen has not adopted a NPOA-Shark. The country has not ratified the Port State Measures Agreement. Yemen is a member of the Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden (PERSGA) and of the Southwest Indian Ocean Fisheries Commission (SWIOFC), and since 2012 it is Contracting Party of IOTC. Table 45 summarizes the main management measures of relevance to shark fisheries.

Table 45. Management measures of relevance to shark fisheries in Yemen. The effectiveness of these measures in addressing the known sources of mortality is noted.

Management measures	Description	Effectiveness
Product form restrictions	All the sharks caught must be landed with their full fins; IOTC: i) thresher sharks (Alopias spp.) not to be retained and to be released unharmed, to the extent practicable, when caught in association to IOTC regulated fisheries (Resolution IOTC 12/09 2012); ii) oceanic whitetip shark (*C. longimanus*) not to be retained and to be released unharmed, to the extent practicable, when caught in association to IOTC regulated fisheries (Resolution IOTC 13/06 2013); iii) prohibition of setting a purse seine net around a whale shark (*R. typus*), in the IOTC area of competence. (Resolution IOTC 13/05 2015).	**Low.** Regulation with no effect on small-scale fisheries targeting sharks for both fins and meat. Possible effect on the retention of sharks by industrial trawlers fishing for cuttlefish and other demersal species. Post-capture mortality is unknown in this fisheries, but probably high.
Spatial restrictions	Prohibited the operation of industrial vessels under 6 nautical miles from the coast. This area is allocated for the artisanal sector.	**Low – Medium.** Measure has no effect on the artisanal sector, which target sharks. Limiting access of trawlers to inshore areas can protect nursery areas for hammerheads. Measure has apparently contributed to the recovery of f Al-mahara and

Management measures	Description	Effectiveness
		Hadramout coastal area (Shaher, 2007).
Gear restrictions	Long-line is the only gear allowed to be used in the target fishery for sharks.	**Low.** Sharks are also legally caught as bycatch in other commercial fisheries.
Participatory restrictions	Boat registration and licenses required (including for artisanal fishers)	**Low.** Licensing has negligible effect if not used to limit entry and therefore control the number of vessels participating in the fishery.

Supporting information

The monitoring of the artisanal landings is reported to be efficient (FAO/ SWIOFC, 2008), however all species of sharks are reported in a single taxonomic group. The lack of species-specific landings data hampers the monitoring of trends in the abundance and status of these resources. There is a general paucity of biological and fisheries data on sharks in Yemen. Shaher (2007) reported the results of surveys conducted in small-scale fisheries landing sites in Al Mahra and Socotra Archipelago between 2003 and 2004, which aimed at estimating the composition of catches (species and sizes), CPUE and obtain biological samples of main species. Besides the mean size of *S. lewini* in the catch, no other biological information of relevance to the assessment of the listed species was obtained. According to the information provided in the consultation, the government is planning the collection of biological and fisheries data as a first step towards the conservation of the listed species.

Monitoring, Control and Surveillance (MCS) capacity

Small-scale fishers are organised into 130 cooperatives along the coast. In all the landing centres there are cooperatives and data collectors from the Ministry of Fishery who registry the catch and effort. As noted by FAO/SWIOFC (2008) "nobody can sell the fish before they register the catch". The data collected include engine power, fishing site, fish species and consumption. Besides the dockside monitoring of catches, there is no other MCS tool operational for the small-scale sector. At the moment only trawlers and transportation vessels are covered by logbooks. These vessels are required to be registered and to record the catches of demersal fishes, cuttlefish and deep sea lobster. Problems with effort controls and law enforcement seem to be common (Shaher, 2007).

Legal acquisition findings

Legislation

As noted above, the Law No.2/ 2006 for the Regulation, Conservation and Exploitation of the Marine Organisms is the main legal framework for fisheries management in Yemen. Other specific by-laws define the technical measures for fisheries regulation (Table 45 summarizes the main measures of relevance to sharks). The trade in CITES-listed species is regulated by the resolution of the Ministers council No. 104 of 2002, which is the national legislation of CITES in Yemen. Because Yemen entered a reservation to the listing of hammerheads in Appendix II, the national CITES management authority is not required to issue export permits for hammerhead products in trade and therefore is not required to make the legal acquisition findings for these species. No such reservations are in place for the other species. According the evaluation conducted by the

CITES Secretariat[30], the country legislation meets the minimum requirements for implementation of CITES (Category 1).

Species identification

Yemen reports to FAO almost all the landings of sharks at class level (Elasmobranchii). The poor reporting of catches reflect both a low priority given to sharks by the fisheries authorities and the lack of resources and capacity of data collectors to identify the species of shark. Shark identification tools are available for the region (Bonfil and Abdallah, 2004; FAO, 2007) and could be easily used to produce field guides in local language. On the other hand, no tools are currently available for the identification of species in the products in trade. Trainings for the identifications of fins will be particularly needed, giving the importance of the fin trade.

Traceability

There are no traceability mechanisms that could assist in the verification of the origin and legality of shark and ray products along the supply chain. The eventual development of a traceability system should take advantage of the fact that both small-scale and industrial vessels are required to be registered and licensed and that all the catches must be registered by government officials before they are marketed by cooperatives. Improvements in the MCS system will be in any case required to allow the proper verification of compliance with regulations, specially the area restrictions.

Institutional collaboration

In Yemen, the Ministry of Fisheries (MoF) is responsible for regulating fishing and the Environment Protection Authority (EPA) is responsible for protecting the marine environment. The EPA is the CITES management Authority. The MoF is a member of the CITES scientific authority and is responsible for providing support in relation to all marine species listed in CITES, particularly in the making of non-detriment findings, the definition of export quotas and the control of illegal trade in marine species. Since the listings of sharks in CITES, the EPA started cooperating with the International Fund for Animal Welfare (IFAW) on capacity building activities of fisheries officials on the different international agreement of relevance to sharks and specifically on the CITES requirements for exporting listed species of sharks. The first capacity-building training workshop took place in Al Mukalla, from 21-24 October 2013. In terms of regional collaboration in fisheries assessment and management, it should be highlighted that Yemen is a member of three Regional Fishery Bodies in the region: the SWIOFC (members Comoros, France, Kenya, Madagascar, Maldives, Mauritius, Mozambique, Seychelles, Somalia, South Africa, United Rep. of Tanzania, Yemen); PERSGA (members Djibouti, Egypt, Jordan, Saudi Arabia, Somalia, Sudan, Yemen) and in 2012 Yemen became Contracting Party of IOTC.

According to a recent performance review commissioned by FAO, the SWIOFC has played an important role in promoting and facilitating collaboration and cooperation in the region with regard to fisheries issues, serving as a platform for the development of different regional projects. The organization has not however advanced towards the integration of regional data for the assessment of shared resources or to the joint management of these resources.

PERSGA is implementing a Regional Shark Assessment Program (RSCP) aimed at establishing a regular periodic assessment of the status of sharks and their management in the region, in order to assist in developing effective management policy, identifying cost effective strategies, ensuring sustainability, and strengthening regional cooperation in management and conservation of shark stocks in the region. PERSGA recently organised a meeting that identified the following priority actions for the RSCPA (www.persga.org):

- Establish a regional database for shark stocks information and capture data at PERSGA.
- Improve the quality of data collection and monitoring, considering species compositions and weights in the catches.
- Develop a Regional Action Plan (RAP-Sharks) in light of the International Plan of Action for Conservation of Sharks (IPAC-Sharks).

[30] CoP17 Doc. 22 Annex 3 (Rev. 1) Status of legislative progress for implementing CITES (updated on 1 September 2016).

- Revision of legislations and improve regulations for protection of sharks.
- Develop national laws and regulations for prohibiting targeting sharks by fishing.
- Adopt mechanisms and regulations to reduce incidental capture of sharks and shark bycatch.
- Promote regional coordination in legislative and management issues through networking, regular meetings and the regular shark assessment process.
- Facilitate cooperation and coordination in control of illegal shark fishing, marketing and export.
- Undertake a regional study for assessment of shark breeding sites and important habitats.
- Encourage research studies on shark biology and ecology in the Red Sea and Gulf of Aden.
- Undertake a regional study and develop guidelines for reducing the impacts of fisheries bycatch and incidental capture on shark stocks.
- Seeking mechanisms for mobilizing funds to support shark research in the region.
- Provide the regional database at PERSGA with the results of recent research dissertations and surveys focusing on sharks in the member states.
- Conduct regional and national training workshops on shark taxonomy, species identification and data collection, and stock assessment.
- Exchange expertise for training capacities among PERSGA countries through the Regional Shark Assessment Program (RSCP).

LATIN AMERICA

Argentina

SUMMARY INFORMATION ON SHARK FISHERIES AND TRADE

Of the listed shark species, only *L. nasus* is officially reported by Argentina. The species is caught as bycatch in industrial trawling (bottom and semi-pelagic) fisheries for the Patagonian grenadier (*Macroronus magellanicus*) and the southern blue whiting (*Micromesistius australis*). Catches of the species have been regularly reported by observers on board trawlers, particularly in semi-pelagic trawling fisheries (Waessle and Cortes, 2011). Catches are very low (less then 0.5 tonnes was reported to FAO in 2010) and have no economic relevance to national fisheries. There are more than 82 species of elasmobranchs in Argentinean waters, which are caught both as target and bycatch in artisanal and industrial fisheries. Total elasmobranch catches peaked at 46 461 tonnes in 2008, gradually declining after that to 29 743 tonnes in 2015 (Figure 27). The group as a whole has a relatively low importance to national fisheries, accounting for about 6 percent of the total marine catches in recent years.

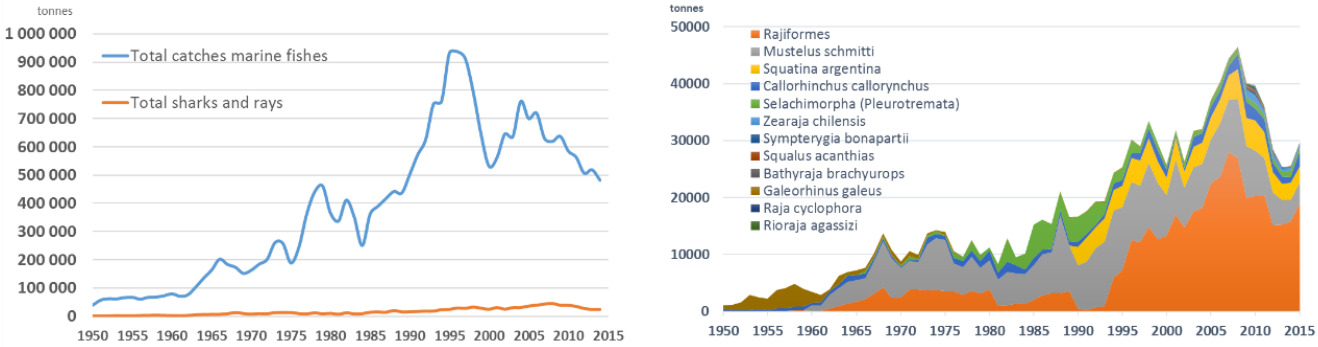

Figure 27. Marine capture fisheries production and the composition of the shark catches of Argentina (Source: FAO, 2017a).

As noted above, catches of porbeagle are incidental, having practically no relevance to Argentinean fisheries. According to the information obtained from the Guardaparque Guillermo Lingua, Subsecretaría de Planificación y Política Ambiental Secretaría de Ambiente y Desarrollo Sustentable (pers. comms.), the species is not consumed locally nor exported. The fisheries sector of Argentina is mostly oriented to the export markets, with 90 percent of the catches exported annually (FAO, 2008). Elasmobranchs are no exception and are mostly exported. Argentina has historically been an important producer of skates and rays (Dent and Clarke, 2015), with these species representing an average of 71 percent of Argentina's annual chondrichthyan capture volume of 35 629 tonnes from 2006 to 2015. According to FAO trade data, the country exported annually an average of 10 419 tonnes of shark products from 2008 to 2013 (Table 46); the main products in trade being frozen sharks, rays and chimaeras and frozen shark fillets. In general terms the main export destination for shark products include the Republic of Korea, China, France and Japan (Dent and Clarke, 2015). Shark exports represented about 2.1 percent of the total exports of Argentinean marine fisheries commodities in the period.

Table 46. Average (2008 – 2013) trade flow of shark products from Argentina (Fao, 2016c).

Commodity (average 2008-2013)	Export		Import	
	Tonnes	USD'000	Tonnes	USD'000
Dogfish (Squalidae) and catshark fillets, frozen	11	29		
Dogfish (Squalidae), frozen	29	52		
Rays and skates (Rajidae), fresh or chilled	24	29		
Shark fillets nei, frozen	968	3 064		
Shark fins, dried, whether or not salted, etc.	52	1 876		
Sharks nei, fresh or chilled	2	2		
Sharks nei, frozen	3 678	7 156	1	3
Sharks, dried, whether or not salted, but not smoked	6	158		
Sharks, rays, chimaeras nei, frozen	5 532	10 686		
Sharks, rays, chimeras, dried, whether or not salted, nei	39	538		
Sharks,rays,chimaeras, skates, fillets, frozen, nei	79	470		
Total sharks commodities	**10 419**	**24 061**	**1**	**3**
Total all marine fisheries commodities	**480 843**	**1 342 618**	**40 789**	**144 770**

ASSESSMENT OF NATIONAL CAPACITY TO IMPLEMENT CITES REQUIREMENTS

Non-detriment findings

Management regime

Marine fisheries operate under the legal framework of the Federal Fisheries Law (Ley Federal de Pesca) No. 24.922 of 1998 and following amendments. It is the responsibility of the Federal Fisheries Council (Consejo Federal Pesquero (CFP) to establish the polices and regulations for the fisheries sector. In 1973, Uruguay and Argentina signed the "Tratado del Río de la Plata y su Frente Marítimo" concerning the Rio de la Plata and the corresponding Maritime Boundary. For the implementation of this international agreement several regulations are adopted by the "Comisión Técnica Mixta del Frente Marítimo (CTMFM) " every year for the management of the shared fisheries resources. The more Relevant for shark species are:

- Resolución N° 15/2013 - Establishing the prohibition of trawl fisheries in the common area for the protection of cartilagonous fishes.
- Resolución Nº 7/2016 - Establishing the TAC for angel fishes of the genus *Squatina*;
- Resolución Nº 9/2016 - Establishing a pilot study for the evaluation of the proportion of sharks in the bycatch;
- Resolución 5/2017 - Establishing the TAC for rays in coastal and high sea rays and skates for the year 2017.

In Argentina, the management of each of the main fisheries (including the trawling fisheries for Patagonian grenadier and the southern blue whiting) is overseen by specific Fisheries Commissions. The Commissions have established management measures for these main fisheries, taking into account the actions elaborated in the NPOA-Sharks. Argentina developed and implemented the *NPOA-Sharks* since 2009 (Res. CFP 6/2009) two workshops were held to evaluate the advances in its implementation (2010 and 2013; available at). A Review of NPOA-Sharks was developed and adopted in 2015. In addition, in 2015 a workshop was organised for the elaboration of the RPOA-Sharks of Argentina-Uruguay.

Argentina has not ratified the FAO Port States Agreement but has adopted a NPOA-IUU (Res. CFP no. 1/2008. The country is a member of the CCAMLR and of the Joint Technical Commission of the Maritime Front (CTMFM). Table 47 summarizes the main management measures in place of relevance to the listed species of sharks.

Table 47. Management measures of relevance to shark fisheries in Argentina. The effectiveness of these measures in addressing the known sources of mortality is noted.

Management measures	Description	Effectiveness
Catch restrictions	Prohibited target fisheries for elasmobranchs (Res. CFP no. 4/2013). Maximum limit for the landings of elasmobranchs per fishing trip fixed from 30 percent to 50 percent of the total catch (Res. CFP n°4/2013, n°7/2013). Total allowable catches for Narrownose smoothhound shark (*Mustelus schmitti*), Angel sharks (*Squatina sp.*) and skates (family Rajidae) in the CTMFM since 2012 (Res. CTMFM 07-2014; Res. CTMFM 05-2014; Res. CTMFM 08-2014; Res. CTMFM 07-2016). Targeting of sharks in the Convention Area of CCAMLR prohibited for purposes other than scientific research. Any bycatch of shark (especially juveniles and gravid females) to be released alive, as far as possible. Members to implement measures to minimize incidental mortality of non-target species, including sharks.	**Low.** National measures restricting direct fisheries for sharks with a low effect for porbeagle, since the species is only sporadically caught. Relative importance of porbeagle catches by Argentinean vessels in CCAMLR Convention Area unknown.
Maximum size	Obligatory release of sharks with more than 1.6 m of TL caught alive. Dead individuals must be kept on board and transported to a research center close to the landing port (Res. CFP n°13/2003, n°13/2009 and n°4/2013). Prohibited use of "bicheros" (hooks) for live release of individuals referred above (Res. CFP n°4/2013).	**Low - Medium.** Some level of protection for large/mature individuals caught in trawling fisheries (modal lengths of individuals in the catch are 150/160 cm and 180/190 cm FL; Waessle and Cortes, 2011). Actual level of effectiveness unknown because of the lack of information on how individuals are released and the level of post-capture mortality.
Spatial restrictions	Prohibited bottom trawling for the protection of elasmobranchs in the area delimited by the following coordinates: - Closure Bonaerense: North: 36°S and its intersection with the Exterior Limit of the la Plata River; South: 37°S; West: exterior limit of the Argentinean territorial sea; East: 56°00'W; valid from 1 November 2013 to 31 March 2014 (Resol. CTMFM 15-2013) and -Clousure of "El Rincón" valid from 1 November to 31 March (Resol. CFP n°27/2009, n°2/2010).	**Low.** Area under protection too small and of no relevance for the main fisheries interacting with porbeagle.
Temporal restrictions	Temporary closures with the objective to protect reproductive aggregations and nursery areas of main species of elasmobranchs: -Closure of "El Rincón" (1 October – 31 March): Resol. CFP n°27/2009, n°2/2010; - Closure Bonaerense: Resol. CTMFM	**Low**: areas affected by this restrictions are too small and not within the main area of operation of the main fisheries interacting with porbeagle.

Management measures	Description	Effectiveness
	n°15/2013 and DPP n°06/2013; see details in spatial restrictions above.	
Product form restrictions	Prohibited finning of sharks before landing (Res. CFP n°13/2003, n°13/2009 and n°4/2013). Legal Catch Certificate for exports of skates species (Disp. SAGyP 174/2015) implemented since 2015.	**Low.** Incentive to release porbeagle because of the finning ban would be low because the meat has also a high value in international markets.
Gear restrictions	Minimum mesh size of 120 mm in the cod end of trawl gears used in the fisheries for the Patagonian grenadier and southern blue whiting (Res. CFP 22-2012 and 23-2012).	**Low.** Min. mesh size have no effect on porbeagle bycatch.

Supporting information

Data on the incidental catches of porbeagle is collected by observers on board (program run by the Instituto Nacional de Investigaciones Pesqueras (INIDEP). Catch information for most shark species of economic importance or conservation concern are recorded at the species level. As part of the NPOA-Sharks, the country has been promoting research on Chondrichthyes and the collection of information on species of concern, including the porgeable. The size and sex composition of the catch and the temporal and spatial distribution of individuals incidentally caught are available since 2003 (Waessle, 2007; Waessle and Cortes, 2011). There are no assessments of the stock in Argentina. ICCAT used porbeagle CPUE time series data from the Uruguayan pelagic longline fleet to assess the status of the stock in the Southwest Atlantic SCRS (2009). Surplus production and age-structured models were used to assess the current status of the stock in relation to biological reference points (biomass and fishing mortality). SCRS (2009) concluded that despite the convergence of the methods in showing potential declines in porbeagle abundance in the Southwest Atlantic, data are too limited to provide a robust indication on the status of the stock. Improvements in the data could potentially lead to better assessment models for the species in the area in the near future.

Monitoring, Control and Surveillance (MCS) capacity

The main fisheries catching porbeagle are well covered by a system of MCS, which integrates electronic logbooks, observers on board, VMS, dockside monitoring and sea and port inspections (Annex 4). These tools supply information to the National Integrated Monitoring System of Fishing Activities (SICAP), operated by the Undersecretariat of Fisheries and Aquaculture (SSPyA) (FAO, 2008).

Legal acquisition findings

Legislation

Relevant national measures for the management of shark fisheries are based on the General Law No. 24.922 on Fisheries (1998). Specific policies and regulations are established by the Federal Fisheries Council (Consejo Federal Pesquero, CFP; see Table 47). The General Environmental Law No. 25.675 (2002) lays out the organizing principles and the basic framework of Argentina's environmental policy, including the application of the precautionary principle. Regionally the country has also to follow the resolutions adopted by the CTMFM and CCAMLR. Considering that porbeagle is mainly caught outside the jurisdiction area of the CTMFM, these norms are less relevant to the species.

The Law No. 22.344 (1982) and its regulatory Decree No 522/97 implements the norms of CITES nationally. Complementary regulations are provided by specific Resolutions of the Dirección Nacional de Ordenamiento Ambiental y Conservación de la Biodiversidad (www.ambiente.gov.ar). Argentina adopts a specific system for issuing CITES Permits for Listings Chondrichthyans (Resolución SAyDS 321/2015). According the

evaluation conducted by the CITES Secretariat[31], the country legislation meet all the minimum requirements for implementation of CITES (Category 1).

Species identification

The National Institute of Fisheries Research and Development (INIDEP) has developed catalogues and field guides for the identification of shark species (see for instance http://www.sagpya.gov.ar). They are used by the National Board Observer Program and inspectors of the Undersecretary of Fisheries and Aquaculture (SSPyA) that perform the control of landings. According to FAO (2008) the available identification tools allows the identification of approximately 30 percent of the total number of condrictian species that occur in Argentina, including porbeagle shark. On the other hand, no methodologies for the identification of products derived from sharks are used. Also the only specific tariff codes for sharks used in Argentina are for *Mustelus schmitti* (smooth hound), *Galeorhinus galeus* (tope shark) and *Squalus acanthias* (spiny dogfish), the other species are lumped together in broad commodity codes. Considering the prohibition of the catch and commercial use of sharks with more than 160 cm, and that a large proportion of the porbeagle caught in trawling fisheries are above this limit (Waessle and Cortes, 2011), it is unlikely that significant volumes of porbeagle will be traded from Argentina. According to the CITES trade database, until now none of the shark species listed in CITES have been exported from Argentina. The use of fin-guides and DNA techniques (for meat) will be needed when the species is traded.

Traceability

Considering that porbeagle is mainly caught in industrial trawling fisheries that are well covered by MCS tools, it is reasonable to conclude that the country has the means and capacity to verify the origin and legality of the sharks products in trade. According to the information provided by Guillermo Lingua (Subsecretaría de Planificación y Política Ambiental, Secretaría de Ambiente y Desarrollo Sustentable), catch certificates can be issued, upon request by seafood exporters, by the National Directorate of Fisheries Coordination (DNCP) under the Undersecretary of Fisheries and Aquaculture (SSPyA), of the Ministry of Agriculture, Livestock, Fisheries and Food. In the case of export of a CITES species, DNCP issue a special certificate to be presented before national CITES authorities (Ministry of Environment and Sustainable Development - SAyDS) identifying the origin of the catch to be exported. The certification is based on the Integrated Fisheries Control System (SICAP) that controls the validity of the permits at landing (inspections) and monitors compliance with management measures (e.g. restricted areas). It is worth noting that since 2012 the fishery for the Patagonian grenadier is certified by the Marine Stewardship Council (MSC). The obtain and maintain the MSC ecolabel the fishery must meet all national and international laws that regulate its activity, including norms concerning the bycatch of protected species.

Institutional collaboration

The required level of collaboration between CITES and fisheries authorities is ensured by the designation of INIDEP and SSPyA as CITES Scientific Authorities. The Ministry of Environment and Sustainable Development (SAyDS) is the Management Authority. While there have been no exports of aquatic species included in the CITES appendices, the SSPyA and SAyDS have been working jointly in the exchange of information relating to fishing and aquatic resources. A mechanism has been also established for the issuing of a Certificate of Legal Capture for the CITES listed species by the SSPyA (see Traceability).

As part of the Technical Commission for the Maritime Front (CTMFM) between Argentina and the Republic of Uruguay, a Working Group on Chondrichthyans was created. The GT-Chondrichthyans made estimates of biologically acceptable or precautionary catches for key species or groups of species of cartilaginous fish commercially exploited and made recommendations for the establishment of management measures by the CTMFM. However none of the CITES listed species have been considered because they are not commercially exploited in the area of the CTMFM.

31 CoP17 Doc. 22 Annex 3 (Rev. 1) Status of legislative progress for implementing CITES (updated on 1 September 2016).

Brazil

SUMMARY INFORMATION ON SHARK FISHERIES AND TRADE

All the recently listed species are caught in Brazilian waters or by Brazilian fleets operating in international waters. Hammerheads (mainly *S. lewini* and *S. zygaena*) are caught as bycatch in pelagic longline fisheries for tuna, swordfish and blue shark, and in bottom gillnet and bottom trawling fisheries targeting demersal fish species (especially Scianidae). The species are also caught in small-scale fisheries (using gillnet, longline, and fish weirs) and recreational fisheries with rod and reel. A target drift gillnet fishery for hammerheads was also in operation in southern Brazil until recently. The fishery became prohibited in 2012. Oceanic whitetip shark, porbeagle and manta rays are less frequently caught as bycatch in pelagic longline and (until recently) in drift gillnet fisheries, including in international waters. Manta rays are usually discarded and the data on discards are scarce. Most of the information available relates to the catches of hammerheads by the fleet based in Santa Catarina (southern Brazil). Between 2000 and 2012, hammerheads represented 0.15 percent of the total marine catches of the fleet, with an average landing of 179 tonnes/year. A declining trend in catches was observed in the period, with catches in the last 5 years below 50 tonnes/year. About 69 percent of the hammerhead catches are form bottom gillnet fisheries (average of 200 vessels in operation annually), 29 percent from pelagic longline (ca. 80 vessels) and the remaining 2 percent from other fisheries. According to data reported to FAO, the national catches of hammerheads from 2008 to 2012 has been in the order of 107 tonnes/year, and since 2013 hammerheads are no longer reported. Catches of oceanic whitetip were in the order of 240 tonnes/year from 2000 to 2008. Since 2009 there are no records of catches of the species in Brazil (in part explained by the prohibition of the capture and trade of the species by ICCAT and the Interministerial Norm No. 1 of 2013, prohibiting fishing oceanic whitetip shark within the waters under Brazilian jurisdiction). Silky shark and (*C. falciformis*) and the bigeye thresher shark (*A. superciliosus*) reported were in the order of 11 and 17 tonnes/year from 2010 to 2014. Overall, the total catches of sharks and rays in Brazil reached a peak of 31 259 tonnes in 1982, declining in the following years. Shark catches from 2016 to 2015 have been oscillating around 20 000 tonnes/year, representing 4.3 percent of the total marine catches of Brazil (Figure 28).

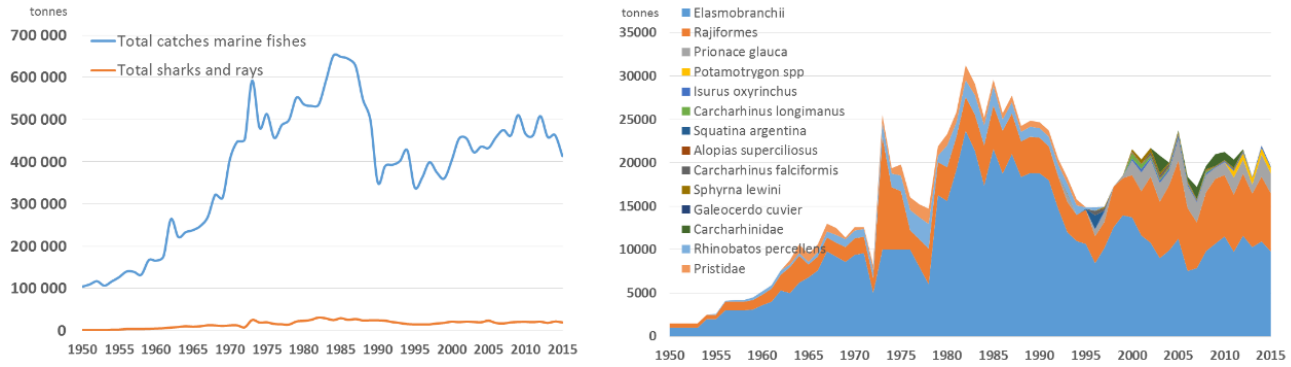

Figure 28. Marine capture fisheries production and the composition of the shark catches of Brazil (Source: FAO, 2017a).

Even with high chondrichthyan capture production, the growth of the market in Brazil increased from 2 621 in 2000 to 23 046 tonnes in 2012. (Table 48). Uruguay is a major supplier to the Brazilian market, re-exporting shark meat that is landed directly in Uruguayan ports, although its dominant position as a supplier has been diminishing in recent years (Dent and Clarke, 2015). The supply chain of the listed species is not well known. The meat of hammerhead is marketed fresh in domestic markets as "shark meat". Fins are sold to intermediates at the landing port and processed (dried) before being exported to Asian markets. The other listed species have apparently the same type of use (meat consumed domestically and fins exported), although no data is available. There is interest in manta rays gill rakers, but its trade is incipient [Henrique Anatole Cardoso Ramos, Coordinator for Fisheries Resources at the Brazilian Institute of Environment and Renewable Natural Resources (IBAMA, CITES Scientific Authority), pers.comms.]. In general, shark fins seem to be main product exported from Brazil, with an average export volume of 63 tonnes in recent years, valued about 2 million USD per year (Table 48).

Table 48. Average (2008 – 2013) trade flow of shark products from Brazil (FAO, 2016c)

Commodity (average 2008-2013)	Export		Import	
	Tonnes	USD'000	Tonnes	USD'000
Rays and skates (Rajidae), frozen	459	1 407		
Shark fillets nei, frozen			1 248	3 209
Shark fins, dried, whether or not salted, etc.	63	1 953	0	0
Shark fins, salted and in brine but not dried or smoked	0	0		
Sharks nei, fresh or chilled	0	0	32	26
Sharks nei, frozen	5	18	19 596	39 171
Sharks, dried, whether or not salted, but not smoked	0	0	0	0
Total sharks commodities	**527**	**3 378**	**20 876**	**42 407**
Total all marine fisheries commodities	**42 855**	**235 937**	**319 174**	**1 082 362**

ASSESSMENT OF NATIONAL CAPACITY TO IMPLEMENT CITES REQUIREMENTS

Non-detriment findings

Management regime

The Fisheries Code (Law nº 11.959 of 2009) provides the overarching legal framework for fisheries management, while specific decrees and by-laws, issued by the Ministry of Fisheries and Aquaculture and the Ministry of Environment (the two institutions responsible for fisheries management), provide specific regulations for the management and conservation of sharks (Table 49). Technical working groups and committees have been established to provide advice for the management of gillnet and tuna longline fisheries. A proposal for a management plan for the sustainable use of elasmobranch species was elaborated in 2011 but was not implemented until now. A National Plan of Action for the Conservation of Endangered Marine Elasmobranchs was adopted in 2014 and implemented throught the Order No. 575 (2014-12-05) creating the Technical Advisory Group to monitor the implementation of the "PAN Sharks". The country has signed but not yet ratified the Port State Measures Agreement. Brazil is a member of CCAMLR, WECAFC and ICCAT.

Table 49. Management measures of relevance to shark fisheries in Brazil. The effectiveness of these measures in addressing the known sources of mortality is noted.

Management measures	Description	Effectiveness
Species prohibitions	Decree MMA 445/2014 establishing a list of fish and aquatic invertebrates endangered or threatened species, that is the National Official Threatened Fauna Species Extinction-Fish and Aquatic Invertebrates. Interministerial Norm No. 1 (2013) establishes the prohibition of fishing the oceanic whitetip shark (*C. longimanus*) fish species within the waters under Brazilian jurisdiction. In particular it applies for: fishing, possession on board, transhipment, landing, storage, transport and trade of whitetip shark. Decree No. 60.133 declaring endangered wildlife species and those near to be threatened within the State of São Paulo, including Sphyrnidae and Pristidae. Prohibited catch, retention, transhipment, landing, storage, transportation and trade in mobulidae species	**Medium.** Norms in place practically forbid the capture and trade in all listed species. Catches of hammerheads in gillnet fisheries (the main source of mortality) is to be regulated by management plan, but no such a plan is still in place.

Management measures	Description	Effectiveness
	(including manta rays) in national waters (Decree MPA/MMA No2/2013). Prohibited catch and trade of thresher sharks of the species bigeye thresher shark, oceanic whitetip sharks, hammerhead sharks (except for *S. tiburo*) and silky shark in tuna fisheries regulated by ICCAT (Recommendations 09-07 2009, 10-07 2010, 10-08 2010, 11-08 2011). Moreover, porbeagle should be promptly release unharmed, to the extent practicable (ICCAT Recommendation 13-10 2013).	
Spatial restrictions	Prohibited trawl fishing at a distance of less than 3 nautical miles from shore (Decree No. 26/1983) Prohibited fishing with gillnets in four areas in shelf waters of southern Brazil as well as at distances of less than 3 to 5 nautical miles from the coast (depending of the size of the vessels) (Decree MPA/MMA n° 12/2012).	**Medium.** Measure provides some level of protection of nursery areas for hammerhead sharks.
Temporal restrictions	Prohibited fishing with gillnets in southern Brazil between 15 May and 15 June. Measure applicable to industrial vessels (tonnage > 20) (Decree MPA/MMA n° 12/2012)	**Low.** Fishing closure too short and not overlapping with reproductive period of hammerheads (austral spring/summer).
Product form restrictions	Prohibited finning of sharks before landing (individuals must be landed with fins attached to body) (Decree MMA/MPA No. 14/ 2012).	**Low – Medium**. Measure provides some incentive to release individuals incidentally caught. Effect on mortality is lower because meat has also value. Level of post-release mortality unknown.
Gear restrictions	Only gillnets with the following specifications are allowed to be used in southern Brazil (Decree MPA/MMA n° 12/2012): - maximum length from 3000 to 18 000 meters for bottom gillnets (depending on the size of vessels) and of 2500 meters of pelagic gillnets. - maximum height of 4 meters - hanging ratio equal of higher than 0.5 - mesh size between 70 mm and 140 mm. Prohibited the use of oceanic drift gillnets (Decree MPA/MMA no 11/2012).	**Medium.** Measures control direct gillnet fisheries for sharks and put an overall limit on gillnet fishing effort. However gillnet effort at present is considered too high (Vasconcellos *et al*., 2014)
Participatory restrictions	Only licensed vessels are allowed to operate. Vessel licenses define type of fisheries, species and areas of operation allowed (Decree MPA/MMA n° 10/2011).	**Low - Medium**. Although the measure effectively forbids the target fisheries for sharks and limits their capture as bycatch,

Management measures	Description	Effectiveness
		there are no established limits to the number of licenses (with the exception of gillnets, see below) and to the volume of shark bycatch allowed.
Fishing capacity	Prohibited issuing of new authorizations for gillnet fisheries, in effect freezing the size of the gillnet fishing fleet in operation in southern Brazil (Decree MPA/MMA n° 12/2012).	**Low – Medium**. Together with the gear restrictions, this measure puts a limit to the fishing capacity of the gillnet fleet. However the current fishing capacity and effort of the fleet is considered excessive (Vasconcellos *et al*., 2014).
Others	Decree IBAMA no. 16 September 2015 establishes specific procedures and criteria for the control of the landings and trade of sharks, including the required registration of companies engaged in shark fin trade, the registration of fishing vessels engaged in shark fisheries and the required communication of shark landings to enforcement authorities 3 days prior to arriving at landings port. The decree also establishes a mechanism for tracing shark fin in trade.	**Medium**. Measures aimed at combating illegal fishing and trade in sharks, therefore contributing to the implementation of the other management measures listed above.

Supporting information

Since 1995, landings of hammerheads by the industrial fisheries of the state of Santa Catarina, southern Brazil, are being monitored, with some interruptions in a few years. Between 1997 and 1998, there was also the monitoring of catches of these species by the driftnet fishing fleet based in the state of São Paulo. Between 1995 and 1998, some data on hammerheads caught in gillnet and pelagic longline fisheries were obtained by observers on board. The data obtained allowed the characterization of size and sex composition, growth, distribution, the evaluation of abundance trends and the definition of critical areas (including nursery areas) for hammerhead sharks.

The monitoring of landings by the Brazilian government (Ministry of Fisheries and Aquaculture (MPA) and the Brazilian Institute of Geography and Statistics (IBGE)) generates the official fisheries statistics. However this monitoring is facing serious structural difficulties, with monitoring activities interrupted at various points landings, which is limiting the acquisition of information of fishing in general. It is worth noting that in many landings places hammerheads are grouped with other sharks in the fisheries statistics, meaning that the currently reported catches are underestimates of the real situation. The other listed species of shark (*C. longimanus* and *L. nasus*) occur in smaller quantities and are not discriminated in the landings. As for manta rays, because the species is often discarded when caught (except for the gill rakers that are sometimes removed) there are no reported catches.

Currently the main limitations for providing the needed information for the monitoring and management of shark fisheries are: the lack of financial resources to hire field samplers and observers onboard; the lack of financial and human resources to track down the supply chain; lack of capacity of research institutions to conduct age and growth studies and to diagnose the age structure of exploited shark populations; and the lack of financial resources to collect fishery-independent data (research cruises, tagging studies, etc.).

There are no assessments of the stocks of the listed species caught in Brazil. Studies are underway to verify the possibility of defining sustainable levels of exports (no further details could be obtained). ICCAT used porbeagle CPUE time series data from the Uruguayan pelagic longline fleet to assess the status of the stock in the Southwest Atlantic (SCRS, 2009). Surplus production and age-structured models were used to assess the current status of the stock in relation to biological reference points (biomass and fishing mortality). SCRS (2009) concluded that despite the convergence of the methods in showing potential declines in porbeagle abundance in the Southwest Atlantic, data are too limited to provide a robust indication on the status of the stock. Improvements in the data could potentially lead to better assessment models for the species in the area in the near future.

Monitoring, Control and Surveillance (MCS) capacity

The existing MCS system is not yet considered adequate to enforce full compliance with the existing norms (Annex 4). One of the main deficiencies is the limited coverage of the fleet with observers on board - at present the few vessels with observers are part of pilot projects run by universities and NGOs. On the other hand there is a reasonably good coverage of the gillnet and trawling fleet with VMS, which facilitate the enforcement of area restrictions applicable to these fleets. Also all vessels are required to complete and submit fishing logbooks to the competent authorities. The submission of logbooks is one of the required conditions for licence renewal.

Legal acquisition findings

Legislation

The country has a comprehensive legislation aimed at controlling the catch and trade of shark products, which will form the basis for legal acquisition findings. The main legal instruments are listed below and described in detail in Table 49:

- The Fisheries Code (Law nº 11.959 of 2009).
- Decree MMA n°05 of 21 May 2004.
- Decree MMA n° 52 of 8 November 2005
- Decree MPA/MMA n°05 of 15April 2011
- Decree MMA/MPA no. 14 of 26 November 2012.
- Decree MPA/MMA no. 01 of 12 March 2013.
- Decree MPA/MMA no. 02 of 13 March 2013.
- Decree IBAMA no. 02 of 19 February 2014 and its amendment no. 16 September 2015.

The implementation of the provisions of CITES in the country occurred through Decree No 3607 of 21 September 2000. This Decree, among other provisions, designated IBAMA as Management Authority and the Botanical Garden, ICMBIO and IBAMA as Scientific Authorities. According the evaluation conducted by the CITES Secretariat[32], the country legislation meet all the minimum requirements for implementation of CITES (Category 1).

Species identification

Brazil has the means (identification guides) and adequately trained human resources to perform the identification of whole animals and carcasses at landing. On the other hand there is limited capacity to identify the species in the products in trade (dried fins), for which tools and training will be required. Some universities, such as UNESP, have laboratories specializing in molecular techniques (DNA). The Agriculture, Livestock and Supply Ministry (MAPA) of Brazil is also specializing in detecting fraud in the sale of fishery products using molecular analyzes**.**

Traceability

The recently enacted Decree IBAMA no. 02 of 19 February 2014 defines the procedures for control of landing sharks and rays caught in Brazilian Jurisdictional Waters and High Seas by national or foreign vessels, as well

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as for the storage, preservation, processing, transportation, marketing or export of fins. This Decree has several elements that are expected to facilitate the verification of the origin and legality of the fins in trade:

- Every person or company legally responsible for landing sharks and rays, as well as for the storage, preservation, processing, marketing and export of fins must be enrolled in a Federal Technical Registry.
- Vessels employed in the capture of sharks and rays have to report to the enforcement agency, within at least three (3) working days prior to landing, the landing of sharks and rays to be performed at the end of the fishing cruises. In their report they must provide an estimate of the volumes to be landed by species.
- All the catches of sharks and rays must be recorded in a logbook, containing information about the fishing trip, effort, catches by species and volumes of processed products after landing (in the case the fins are removed after landing, the exact volume of fins by species need to be recorded).
- All fins must be accompanied, from the origin, by appropriate fiscal invoices.
- Companies involved in the subsequent steps in the supply chain (commercialization, storage, transport, processing or export) must maintain in a Book of Records copies of all fiscal invoices of commercialization and detailed information about volumes of products commercialized by species.
- The international transport of shark fins must be accompanied by an Export Registry or Import License issued by the Sistema Integrado de Comercio Exterior (SISCOMEX).
- Finally, companies engaged in the export of shark fins must communicate to the environmental enforcement agency (IBAMA) at least 3 days prior to the shipping date, the exact location, date and time that products will be prepared for shipping.

The effective implementation of these norms will serve as a basis for tracing the origin of the shark products in trade. In addition to the above, IBAMA/MMA is currently working on a system of documentation of the origin of fish products (DOP) which could eventually support the making of legal acquisition finding of CITES-listed species by national authorities.

Institutional collaboration

Until recently, fisheries management in Brazil was conducted jointly by two Ministries: the Ministry of Fisheries and Aquaculture (MPA, now extinct; fisheries management authority currently under the Ministry of Agriculture, Livestock and Foo Supply) and the Ministry of Environment (MMA). The two institutions participated in the discussion and elaboration of fisheries regulations, polices and action plans (such as the NPOA-Sharks in preparation). IBAMA (an agency of MMA) is the fisheries enforcement agency and also the CITES Management authority and one of the CITES Scientific Authorities. ICMBio (MMA) is the agency responsible for fisheries research and is also recognized as one of the CITES Scientific Authorities. Considering the above, there are no reasons to expect that the lack of coordination between fisheries and environmental agencies will represent an obstacle to the implementation of the listings.

As a member of ICCAT and WECAFC, Brazil is engaged in discussion and deliberations concerning the conservation and management of sharks in the jurisdiction areas of these RFBs. The country also participated in the Caribbean Large Marine Ecosystem Project (funded by GEF) which aimed to foster the sustainable management of shared marine resources in the region. The project has recently elaborated a ten-year strategic plan that will aim to implement ecosystem approaches to the management of shared living resources in the Caribbean and adjacent areas, based on regional collaboration.

Costa Rica

SUMMARY INFORMATION ON SHARK FISHERIES AND TRADE

A total of 75 species of elasmobranchs are found in Costa Rica, with the highest diversity in the Pacific coast (Zanella, 2006). Artisanal fisheries in Costa Rica account for 75–80 percent of the total annual catch in the country. They include small-scale fisheries that target coastal species using hand-lines, gillnets, and mid-water long-lines; mid-scale fisheries with slightly larger vessels traveling farther from the coast and using gillnet sand long-lines (i.e. surface, bottom-lines, mid-water) to target larger species (i.e. *Epinephelus* sp., *Coryphaena hippurus* and sharks); and smei-inductrial fisheries that utilize pelagic long-lines far off the coast targeting tuna, billfish, and other large fish species (Herrera-Ulloa *et al*., 2011). Hammerheads are apparently caught as bycatch in industrial pelagic longline fisheries and (with the exception of *S. mokarran*) in small-scale longline, gillnet and trawling fisheries targeting other demersal fish and shrimp. Oceanic whitetip and silky shark are caught as bycatch in pelagic longline fisheries (industrial and small-scale). According to Garro *et al*. (2009), sharks represent 3.5 percent of the total catches of small-scale bottom longline fisheries (the main type of fishery catching sharks), which target other demersal fish such as snappers and groupers. Also according to the authors, *S. lewini* represented about 6 percent of the total shark catches in these fisheries. Hammerheads, oceanic whitetip shark and silky shark are caught in national waters and also in areas beyond national jurisdiction. However most of the catches of hammerheads by small-scale fisheries occur in national waters. According to Zanella (2006) more than 98 percent of the total shark catches are from the Pacific coast.

Sharks have a relatively high importance (in volume terms) in Costa Rican fisheries, accounting for about 26 percent of the total marine catches in recent years (Figure 29). The commercial interest on sharks increased after the 1970s with the decline of traditional stocks (e.g. shrimps) and the increased importance of export markets for shark products, especially the Asian market for fins (Zanella, 2006). Total shark catches rapidly increased during the 1990s, reached a historical peak of 12 901 tonnes in 2000 and have been in a declining trend in the last decade. Recent catches are about 4 400 tonnes/year. With the exception of shortfin mako and silky sharks, which have been recorded at species level for some years, the bulk of the shark catches are recorded in the general category "Sharks, rays, skates, etc. nei". Silky shark landings remained stable around 1 100 tonnes in the receint period. The main species landed are thought to be smooth-hounds *Mustelus* spp (Catarci, 2004).

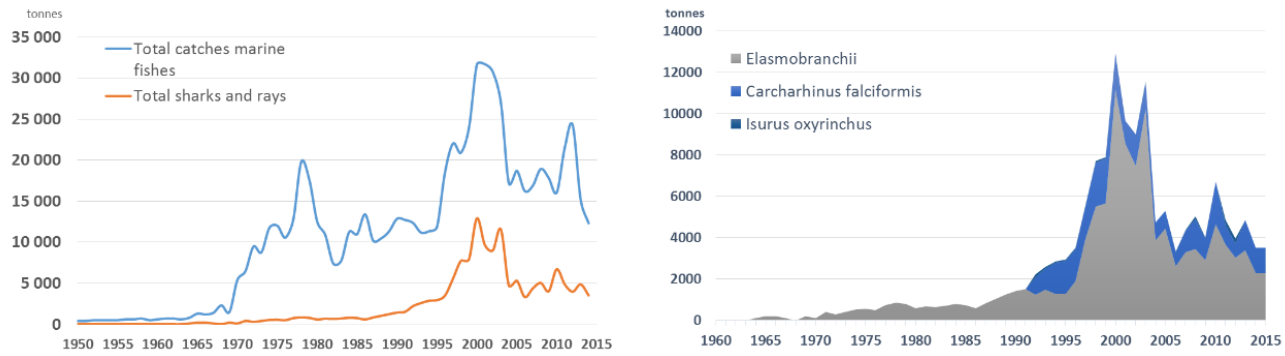

Figure 29. Marine capture fisheries production and the composition of the shark catches of Costa Rica (Source: FAO, 2017a).

Costa Rica is an important exporter of shark fins and a key trading post for shark fishing fleets in the region. Costa Rica appears to not only produce shark fins domestically but also act as important trading hub for neighboring countries and other foreign fleets fishing in the surrounding waters. After years of steep decline, its domestic production of sharks is now relatively small, ranking twenty-eighth in the world. China, Hong Kong SAR is the major destination for shark fins originating from Costa Rica. Costa Rican customs authorities record trade in shark fins under one code only, with no reference to the stage of processing or to whether the shark fin is frozen or dried. There is a large discrepancy between the Costa Rican reported exports and the figures obtained through summing Costa Rican origin imports of major importers. From 2000 to 2011, Costa Rica recorded average annual shark fin exports of 67 tonnes, worth USD 1.9 million. Estimated by the partner

method (Dent and Clarke, 2015), Costa Rica's average annual exports of shark fins over the same period were 668 tonnes, worth USD 8.9 million. This discrepancy indicates a presumably high under reporting of shark catches in the country. There is no species-specific information to evaluate the relative importance of the trade in the listed species, but according to José Joaquin Calvo Domingo (Gerente Vida Silvestre Autoridad Administrativa CITES), it is likely that both meat and fins of these species are consumed locally and also traded internationally.

Table 50. Average (2008 – 2013) trade flow of shark products from Costa Rica (FAO, 2016c).

Commodity (average 2008-2013)	Export		Import	
	Tonnes	USD'000	Tonnes	USD'000
Row Labels	Quantity	Value	Quantity	Value
Shark fins, dried, whether or not salted, etc.	9	510		
Shark fins, frozen	41	186		
Shark fins, salted and in brine but not dried or smoked	2	15		
Sharks nei, fresh or chilled	0	1	2	5
Sharks nei, frozen	2 068	2 683	2 228	1 985
Sharks, dried, whether or not salted, but not smoked	6	267	1	25
Sharks, rays, skates, fresh or chilled, nei	14	21	4	3
Total sharks commodities	**2 140**	**3 684**	**2 234**	**2 019**
Total all marine fisheries commodities	**26 331**	**137 213**	**32 143**	**70 363**

ASSESSMENT OF NATIONAL CAPACITY TO IMPLEMENT CITES REQUIREMENTS

Non-detriment findings

Management regime

The Law on Fisheries and Aquaculture No 8436 of 2005 provides the main legal framework for the management of marine capture fisheries. Of direct relevance to sharks, the Law prohibits finning, requiring the landing of sharks carcasses with the fin naturally attached. It also requires the presence of inspectors on any landing of sharks by national and foreign vessels. Moreover, iIn 2013, with the DECRETO Nº 38.027/MAG Costa Rica established the size at maturity for several species of sharks, among others: *C. falciformis*, *A. pelagicus*, *A. superciliosus* and *S. lewini*. Of general relevance to marine fisheries management, Decree No. 35502-MAG establishes the norms for the implementation of Marine Areas of Responsible Fishing (MARF), aimed at supporting the sustainable use of marine resources through co-management. Costa Rica established the NPOA-Sharks in 2009 and since then different activities were carried out to improve data collection on sharks and to enforce the finning ban. The country has also elaborated a National Plan of Action to combat IUU fishing (it is unclear when it was adopted). Costa Rica is a member of IATTC, OSPESCA, OLDEPESCA, COPESCAALC and WECAFC. OSPESCA elaborated a Regional Plan of Action for Sharks, delineating main actions for the management of shark fisheries by Central American countries (it is unclear if the plan has been formally adopted by member countries). The organization has passed the Regulation OSP 08 of 2014 which seeks to harmonize policies and actions by member countries to combat IUU fishing, laying the ground for the future establishment of a Regional Plan of Action to combat IUU fishing. Costa Rica made the accession to the Port State Measure Agreement in 2015. A summary of the management measures of relevance to the sustainable use and conservation of the listed species of sharks is provided in Table 51.

Table 51. Management measures of relevance to shark fisheries in Costa Rica. The effectiveness of these measures in addressing the known sources of mortality is noted.

Management measures	Description	Effectiveness
Species prohibitions	- Prohibit retaining onboard, transshipping, landing, or storing, in part or whole, carcasses of silky sharks (*C. falciformis*) caught by purse-seine vessels in the IATTC Convention Area. Require all longline vessels whose fishing licences do not include sharks as a fishing target but catch sharks incidentally, to limit bycatch of silky sharks to a maximum of 20 percent of the total catch by fishing trip in weight. Require their multi-species fisheries using surface longlines to limit the catch of silky sharks of less than 100 cm total length to 20 percent of the total number of silky sharks caught during the trip (IATTC C-16-06, 2016). - Require purse-seine vessels flying their flag to follow safe release requirements for all sharks, except those retained aboard the vessel (IATTC C-16-06, 2016). - Prohibit longline vessels flying their flag and targeting tuna or swordfish in the Convention Area from using "shark lines". The IATTC scientific staff shall develop a workplan, for completing full stock assessments for the silky shark (*C. falciformis*) and hammerhead sharks (i.e., *S. lewini*, *S. zygaena* and *S. mokarran*) (C-16-05, 2016). - Prohibit retaining onboard, transshipping, landing, storing, selling, or offering for sale any part or whole carcass of mobulid rays (which includes manta rays and mobula rays) (IATTC C-15-04, 2015); - Prohibited targeting and retention of oceanic Whitetip sharks by fisheries regulated by IATTC. Individuals caught to be released alive, to the extent practicable (Resolution IATTC C-11-10, 2011).	**Low-Medium.** Measure with some effectiveness to oceanic whitetip, silky sharks and mobilidae, if post-release mortality is low. No effect on hammerheads.
Spatial restrictions	According to data available at MPA Global database (www.mpaglobal.org), Costa Rica has designated 26 marine protected areas, covering approximately 5 614 km2 of marine areas (or about 1 percent of the total area of the EEZ). The National Park of Isla del Coco is one of the largest areas under protection (1 948 km2), covering offshore areas of interest for the conservation of oceanic sharks.	**Low.** With the exception of Cocos Island, known for the large aggregations of hammerheads, no information could be obtained on the relevance of the areas under protection for the conservation of the listed species. The total area under protection is however too small to expect a significant effect on the mortality of widely distributed and migratory species of sharks.

Management measures	Description	Effectiveness
Temporal restrictions	Temporal and permanent closures in parts of the Gulf of Nicoya (no detailed information could be obtained).	**Unknown**. Temporal closures could have some positive effect if they coincide with critical events in the reproductive cycle. No information could be obtained in this respect.
Product form restrictions	Prohibited finning of sharks. Required landing and transport of sharks with fins attached to the body (No 8436 of 2005). Regulation OSPESCA OSP-05-11 of 2011 forbids the finning of sharks, which have to be landed with the fins attached to the body. IATTC requires members to fully utilize shark catches and to prohibit finning by applying a 5 percent fin-to-body weight ratio for sharks on board vessels (IATTC Resolution C-05-03 of 2005).	**Low**. Sharks seem to be fully utilized in Costa Rica, being consumed locally and/or exported. The banning of finning would not create an incentive to release sharks incidentally caught in small-scale fisheries. Hammerheads incidentally caught in pelagic longline fishery for tunas would probably have a higher chance of be released. No information on the relative importance of the catches in small-scale and industrial fisheries.
Participatory restrictions	Access to fishing is restricted by licenses or authorizations.	**Low.** Licensing has no effect on mortality if it is not used to limit access**.**
Fishing capacity	Ongoing reduction of the semi-industrial shrimp trawling fleet (no further details provided).	**Unknown**. The relative importance of the bycatch of sharks in shrimp trawlers is unknown.
Others	Decree No. 35502-MAG establishes the norm for the implementation of Marine Areas of Responsible Fishing (MARF), aimed at supporting the sustainable use of marine resources through co-management. For instance, the MARF of Tarcoles (created in 2009) has managed to prohibit the access of shrimp trawlers into the MARF area, which led to an apparent improvement in the abundance and catches of demersal fish stock by small-scale fishers (Rivera *et al*., 201). It has also improved the data on fisheries and trade from small-scale fishers in the MARF. There is no information on other MARFs.	**Low - Medium**. At present there is no information about the effects of MARFs on shark fisheries in Costa Rica. Co-management of small-scale fisheries can lead to a more sustainable use of marine resources, as has been shown in different parts of the world (e.g. Berkes *et al*., 2001). However implementation can be challenging and the actual benefits to conservation will depend on the socio-economic, ecological and institutional context of the fishery.

Supporting information

The country currently lacks basic fisheries and biological data that could be used to support the making of NDF for oceanic whitetip and hammerheads. According to José Joaquin Calvo Domingo (Gerente Vida Silvestre Autoridad Administrativa CITES), among the main limitations are the poor monitoring of small scale fisheries (the situation seems less precarious for the semi-industrial and industrial fleets) and the lack of a systematic program for the collection of biological data on the species. At the local level, Rivera *et al*. (2015) reported how the co-management of small scale fisheries in a Marine Areas of Responsible Fisheries has improved the information on small-scale fisheries catches. However such experiences are in their infancy in Costa Rica and still far from resulting in improved catch statistics on sharks at the country level. Shark catch statistics are highly aggregated and do not differentiate the catches of oceanic whitetip, hammerheads and rays As a member of IATTC, the country is required to submit shark catch and trade data coming from the tuna fishing fleets, when possible separated by species. In spite of that, all records of shark catches by Costa Rican longline fisheries in the IATTC database aggregate sharks and rays in two taxonomic categories (Easmobranchii and Rajiformes) (www.iattc.org). The only specific data records on the FAO database are of silky and shortfin mako sharks (Figure 29). There are no assessments of the status of the species in the country. CPUE data for oceanic whitetip caught in association to tuna fisheries managed by the IATTC (Roman-Verdesoto and Orozco-Zoller, 2005) could potentially serve as basis for the assessment of the status of the stock in the region (IATTC, 2007). Data obtained from diver visual sightings in the Cocos Islands has been also used to assess trends in the abundance of hammerheads (Myers *et al*., 2005) and could be used for future monitoring of trends in the species. Following the resolution C-16-05 (2016), the IATTC scientific staff shall develop a workplan for completing full stock assessments for the silky shark (*C. falciformis*) and hammerhead sharks (i.e., *S. lewini*, *S. zygaena* and *S. mokarran*).

Monitoring, Control and Surveillance (MCS) capacity

The Law on Fisheries and Aquaculture (No 8436 of 2005) requires that all tuna purse seiners authorized to fish in the Costa Rican EEZ carry the needed instruments to allow the motoring of their activity by satellite. The Law also states that the Instituto Costarricense de Pesca y Acuicultura (INCOPESCA) will develop a VMS system to monitor their activities. Also according to the Law, all individuals/vessels authorized to fish have to maintain and submit to INCOPESCA a logbook with the records of all fishing operations. No updated information could be obtained on the state of implementation of these and other MCS tools. The country has a program of port inspection that covers vessels from the semi-industrial (medium-scale) and industrial fleet. The level of coverage of this system is unknown. No similar system is apparently in place for the small-scale fishing vessels (Annex 4).

Legal acquisition findings

Legislation

The Law of Fisheries and Aquaculture (Law No. 8436/2005) sets the overall norms for management of capture fisheries. The Law has very few specific provision concerning shark fisheries, more specifically on shark finning (Articles 40 and 139). Other regulatory instruments provide measures for the enforcement of the finning regulation, such as Decree 34928-MAG, which requires the presence of inspectors during the landing of sharks by national and foreign fleets, and the Agreement AJDIP/371-2010, which defines the authorized port of landing of the foreign longline fleet in order to facilitate the inspection by INCOPESCA, customs and sanitary control officers. Among other general legislation, it is worth noting the Decree No. 35502-MAG which sets the norms for the establishment of Marine Areas of Responsible Fishing (discussed above). The capture of sharks inside marine protected areas are regulated by specific norms established for each area by the Ministry of Environment and Energy (MINAE). As a member of IAATC and OSPESCA, Costa Rica has also to follow specific norms established by these Organizations for the management and conservation of sharks. These norms are described in Table 51.

Chapter IX of the Law on the Conservation of Wildlife (Law No 7317 of 1973, amended by the Law N° 9106 of 2012) establishes the norms for the import, export and re-export of species listed in CITES Appendices. The Law has no specific provisions concerning CITES listed species introduced from the Sea. Such provisions would be more relevant to regulate the eventual introduction of hammerhead sharks, since any capture of oceanic whitetip in the high seas would be considered illegal (see Management Regime).

In 2012 *S. lewini* was included in CITES Appendix III at the request of Costa Rica. Therefore any trade in hammerhead products from/to Costa Rica have to be accompanied by appropriate CITES documentation (export permits and certificate of origin, in the case of imports). The Appendix III listing was valid until the Appendix II listing was in effect in 14 September, 2014.

According the evaluation conducted by the CITES Secretariat[33], the country legislation meet all the minimum requirements for implementation of CITES (Category 1).

Species identification

The high level of taxonomic aggregation of shark catches indicates a limited capacity to identify sharks at the species level. According to information provided by José Joaquin Calvo Domingo (Gerente Vida Silvestre, Autoridad Administrativa CITES, Sistema Nacional de Areas de Conservación, Ministerio del Ambiente, Energía y Telecomunicaciones), the country has manuals and guides for the identification of shark species (e.g. Martinez-Ortiz, 2010). Presently the main limitation seems to be the lack of capacity of field and customs officers to identify the species throughout the supply chain (from landing to export). The development of capacity in the use species identification tools, including id guides and DNA techniques, will be therefore required.

Traceability

There are two aspects of relevance to the traceability of shark catches. First, as stated above, the country has a program of inspection that covers medium size and large size vessels. Vessel owners receive a report from the inspectors after each inspected landing. This report can therefore be used to trace the origin and legality of landings. On the other hand, at the regional level, OSPESCA has enacted a regulation aimed at curbing finning (Regulation OSP-05-11 of 2011) requiring that shark fins not attached to the body entering member countries or who may be exported by them, must be accompanied by a document issued by the competent authority of the country of origin, attesting that they are not the product of finning. These mechanisms can support the making of legal acquisition findings by the competent authorities, if the shortcomings in enforcement and species identification are overcome. At present the main limitations are in the determination of origin and legality of products from small-scale fisheries, which are poorly covered by fisheries monitoring, control and surveillance systems. Also in relation to traceability, it is worth noting that Costa Rica listed *S. lewini* in CITES Appendix III in 2012 (listing valid until September 2014), meaning that any trade in the species had to be accompanied by CITES documentation since before the listing of this species in Appendix II .In the CITES Trade Database (CITES, 2017) two events of exports/import of *S. lewini* and *S. zygaena* for commercial purpose are reported from Costa Rica to China, Hong Kong SAR in 2014–2015, see table 52.

Table 52. Trade records from Costa Rica to China, Hong Kong SAR (Source CITES Trade Database (CITES, 2017).

Year	App.	Taxon	Importer reported quantity	Exporter reported quantity	Term	Unit	Purpose	Source
2014	II	*S. lewini*		167.85	specimens	kg		Wild
2014	II	*S. zygaena*		323.2	specimens	kg	Commercial	Wild
2015	II	*S. lewini*	297.83		fins	kg	Commercial	Wild
2015	II	*S. zygaena*	648.22		fins	kg	Commercial	Wild

There is an ongoing improvement of a traceability system for shark and shark products in the country, including collaboration for the implementation of specific commodity codes for the shark species under Appendix II and collaboration with the CITES Secretariat for revision and improvement of the methods for the traceability of

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the Costa Rica fisheries [Mr. Carvajal Rodríguez (Sistema Nacional de Áreas de Conservación Ministerio del Ambiente y Energía), Pers. comms.]

Institutional collaboration

There are many institutions involved in fisheries management in Costa Rica, but the main authority is the Instituto Costarricense de Pesca y Acuicultura (INCOPESCA) of the Ministerio de Agricultura y Ganadería. The CITES Management Authority is the Sistema Nacional de Áreas de Conservación (SINAC) of the Ministerio de Ambiente y Energía (MINAE). A multi-institutional commission plays the role of Scientific Authority. It is formed by the Universidad de Costa Rica, Universidad Nacional, Instituto Tecnológico de Costa Rica, INCOPESCA, Instituto Costarricense de Pesca y Acuicultura, Museo Nacional de Costa Rica, Colegio Profesional de Biólogos and the Colegio de Médicos Veterinarios. A good level of collaboration seems to exist among these organizations.

At the regional level, it is noteworthy the efforts of the OSPESCA to identify the current gaps and limitations of the region for the implementation of the new listings. Various meetings were held under OSPESCA's Regional Group on Sharks and Highly Migratory Species to discuss the issue, leading to the following technical and administrative recommendations that member countries have to address prior to the entry in force of the listings:

- Coordinate activities between competent authorities (fisheries, environment, trade, customs, etc.) to clarify what are the procedures and impacts of these measures and efforts to seek to establish compliance;
- Conduct an assessment on trade of sharks in the Central American region;
- Develop an information document for the fisheries sector in relation to the steps that must be performed to comply with both appendices III and II.
- Manage cooperation (human and financial resources) to establish a capacity building program to enable countries to meet the requirements of CITES Appendix II. This includes:
    - Legal aspects: adapt legislation according to the inclusion of Appendices II and III);
    - Institutional: technical and administrative capacities as well as human and financial resources;
    - Socialization: making sure that measures will not affect or hinder trade;
    - Trade: traceability, including identification guides and genetic techniques for identifying skin, flesh, teeth, oils, fins, etc.;
    - Statistics: improving the collection of information in the region; collect data separated by species;
    - Export records: change export codes to record the different shark species in trade.

OSPESCA has also enacted regulations specifically aimed at combating illegal fishing activities, including shark finning in the region (see sections above).

Costa Rica has been also carrying out actions with the International Technical Assistance Program of the Department of the Interior of the United States to develop capacity to make Non-detriment Findings for sharks.

A project was also elaborated under OLDEPESCA to enable member countries to develop a stable and robust management system to ensure conservation and management of sharks and their long-term sustainable use (OLDEPESCA, 2011). The project would run for five years, during which the following actions would be implemented: i) research on shark biology; ii) creation of a reliable database of fisheries of these species; iii) information sharing and communication among stakeholders, especially producers and all players who are connected and interact throughout the production chain; iv) consolidation of regulations, which in the best case would follow a similar approach for the whole region; v) capacity building related to accountability, awareness, management and species identification and; vi) the establishment of a program to control and monitoring of these fisheries to avoid breach of the regulations and to ensure sustainable use. No updated information on the status of this project could be obtained.

Finally, as member of IAATC, Costa Rica is required to comply with shark conservation and data reporting measures adopted regionally (see sections above for detailed description of the measures). With appropriate compliance, these measures could contribute to the conservation of the listed species as well as to an improved understanding of their status in the Eastern Pacific Region.

Ecuador

SUMMARY INFORMATION ON SHARK FISHERIES AND TRADE

S. lewini, *S. zygaena* and *C. longimanus* are caught in national and international waters as bycatch in longline and drift gillnet (for hammerheads only) fisheries for tuna and tuna-like species. The fishery involves both industrial and small-scale vessels. Catches of *M. birostris* were reported to FAO in 2007 (5 tonnes) and 2008 (ten tonnes). Also according to FAO data, the average catches of hammerheads from 2008 to 2012 was 145 tonnes/year, representing 2 percent of the total reported catches of sharks and rays. According to FAO data (FAO, 2017a), Ecuador greatly improved the reporting of pelagic sharks at species level starting from 2013. In the period 2013–2015, the average catches of *A. pelagicus* was 5 700 tonnes representing the 77 percent of the shark catches. The catches of silky shark were about 500 tonnes, bigeye thresher 300 tonnes, *S. zygaena* 130 tonnes, *S. lewini* 60 tonnes and oceanic whitetip shark 4 tonnes. The group as whole has a minor importance for national fisheries (Figure 30), accounting for 1.4 percent of the total capture fisheries production.

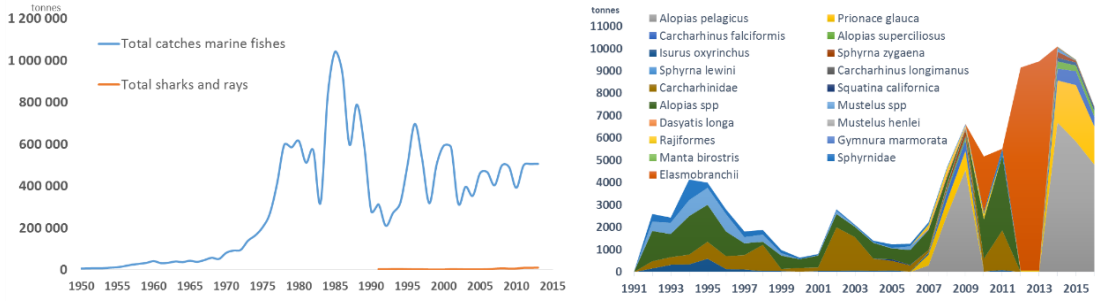

Figure 30. Marine capture fisheries production and the composition of the shark catches of Ecuador (Source: FAO, 2017a).

Catches of the listed species are used for local consumption (meat and fins), while dried fins, skins and cartilage are exported. Although no specific data is available, the volume of products in trade is considered low. Table 53 summarizes the shark trade data reported to FAO. According to these data, Ecuador exporter in the period of 2008 to 2013 an average of 144 tonnes of dried fins and 129 tonnes of shark meat (fresh, chilled and frozen). Only minor quantities of frozen meat were imported in the same period. The total trade in shark products (valued at USD 2 915 million) represents less than 1 percent of the total trade in marine fisheries commodities.

Table 53. Average (2008 – 2013) trade flow of shark products from Ecuador (FAO, 2016c).

Commodity (average 2008-2013)	Export		Import	
	Tonnes	USD'000	Tonnes	USD'000
Shark fins, dried, whether or not salted, etc.	144	2 710	0	0
Sharks nei, fresh or chilled	16	34	0	0
Sharks nei, frozen	113	171	16	26
Total sharks commodities	273	2 915	16	26
Total all marine fisheries commodities	293 081	1 152 101	126 297	206 456

Non-detriment findings

Management regime

The Law of Fisheries and Fisheries Development (Law No. 3 of 1985) implemented by its Decree no. 1143 and regulatory norm (Decree No. 3 198 of 2002) provide the main legal framework for fisheries management. The management and conservation of sharks are covered by three main regulations. The Executive Decree No. 486 of 2008 establishes the national policy for the conservation and management of sharks. The Ministerial Accord No. 093 of 2010 establishes a permanent closure for the fishery of manta rays, while the Ministerial Accord No 116 of 2013 establishes management measures for hammerheads. In addition, the Inter-institutional Authority for the Management of the Galapagos Marine Reserve prohibited the capture, landing and commercialization of sharks in the Galapagos Archipelago (Resolution No. 011-2000 of 15 November 2000). The NPOA-Sharks was formally adopted in 2008 (Executive Decree No 486 of 2008) but started to be implemented already in 2007 with activities such as the control of landings, biological monitoring, traceability of the export of fins and other sub-products, scientific studies, capacity building of fishers in the identification of species and in the adopted management measures, production of identification guides and wider diffusion of measures in the media. Ecuador is a member of IATTC, CPPS, OLDEPESCA, COPESCAALC, SPRFMOs and RAA. The CPPS elaborated a Regional Action Plan for Sharks in 2009 and have been implementing a series of activities since then in support of the management and conservation of sharks by member countries (see Institutional collaboration). Ecuador has not ratified the Port State Measure Agreement. Table 54 summarizes the management measures of relevance to the listed species of sharks.

Table 54. Management measures of relevance to shark fisheries in Ecuador. The effectiveness of these measures in addressing the known sources of mortality is noted.

Management measures	Description	Effectiveness
Species prohibitions	Prohibited the target fishery for *M. birostris*, *Mobula japonica*, *Mobula thurstoni*, *Mobula munkiana* and *Mobula tarapacana* (Ministerial Accord No. 093/ 2010). Prohibited any type of target fisheries for sharks (Executive Decree No. 486 of 2007) Prohibited the retention on board, landing and commercialization of hammerhead sharks caught by industrial vessels and by recreational fishers (Ministerial Accord No 116 of 2013). Prohibit retaining onboard, transshipping, landing, or storing, in part or whole, carcasses of silky sharks (*C. falciformis*) caught by purse-seine vessels in the IATTC Convention Area. Require all longline vessels whose fishing licences do not include sharks as a fishing target but catch sharks incidentally, to limit bycatch of silky sharks to a maximum of 20 percent of the total catch by fishing trip in weight. Require their multi-species fisheries using surface longlines1 to limit the catch of silky sharks of less than 100 cm total length to 20 percent of the total number of silky sharks caught during the trip (IATTC C-16-06, 2016).	**Medium – High.** Measure can provide full protection for manta rays and oceanic whitetip and partial protection of hammerheads (small-scale fisheries allowed). The lack of information on the level of post-release mortality cast doubt on the actual effectiveness.

Management measures	Description	Effectiveness
	Require purse-seine vessels flying their flag to follow safe release requirements for all sharks, except those retained aboard the vessel (IATTC C-16-06, 2016). Prohibit longline vessels flying their flag and targeting tuna or swordfish in the Convention Area from using "shark lines". The IATTC scientific staff shall develop a workplan, for completing full stock assessments for the silky shark (*C. falciformis*) and hammerhead sharks (i.e., *S. lewini, S. zygaena* and *S. mokarran*) (C-16-05, 2016). Prohibit retaining on board, transshipping, landing, storing, selling, or offering for sale any part or whole carcass of mobulid rays (which includes manta rays and mobula rays) (IATTC C-15-04, 2015); Prohibited targeting and retention of oceanic Whitetip sharks by fisheries regulated by IATTC. Individuals caught to be released alive, to the extent practicable (Resolution IATTC C-11-10, 2011).	
Spatial restrictions	Prohibited the capture, landing and commercialization of sharks in the Galapagos Archipelago (Resolution No. 011-2000 of 15 November 2000). Areas within 8 nautical miles from the coats reserved for the activity of artisanal fisheries (no type of industrial fisheries allowed) (Ministerial Accord Nº114)	**Low – Medium.** The Galapagos Marine Reserve (133 000 km2) can provide an important spatial refuge for oceanic sharks, including hammerheads. Reserving coastal areas for artisanal fisheries only affects the (eventual) catches of industrial vessels in shallow waters.
Catch restrictions	Artisanal fishers allowed the capture of a maximum of 5 individuals (juveniles of up to 150 cm TL) of *S. zygaena* and *S. lewini* per fishing trip (Ministerial Accord No 116 of 2013)	**Medium**. Measure establishes a limit to the maximum catch (and mortality) of hammerheads by artisanal fisheries.
Product form restrictions	Prohibited shark finning. Fins must be landed attached to the body (Executive Decree Nº 486 of 2007) IATTC requires members to fully utilize shark catches and to prohibit finning by applying a 5 percent fin-to-body weight ratio for sharks on board vessels (IATTC Resolution C-05-03 of 2005).	**Low**. Sharks seem to be fully utilized in Ecuador, being consumed locally and/or exported. The banning of finning would create little incentive to release sharks incidentally caught in small-scale fisheries.
Participatory restrictions	Access to fishing is restricted by licenses or authorizations.	**Low.** Measure alone cannot guarantee that fishing effort increases beyond capacity of stocks.

Management measures	Description	Effectiveness
Maximum size	Prohibited capture of *S. zyganea* and *S. lewini* with more than 150 cm TL and of gravid females (Ministerial Accord No 116 of 2013).	**Low – Medium**. Measure protects reproductive stock but allow the possibility overfishing juveniles.
Gear restrictions	Prohibited the use of shark (steel) lines ("huaya") in longline fisheries for tuna and tuna-like species (Executive Decree Nº 486 of 2007).	**Medium – High**. Measure can reduce the rate of bycatch of sharks in longline fisheries.

Supporting information

Data on catch and effort obtained through the System of Monitoring and Control of Landings can be used to monitor trends in the listed species. The system collects data through the monitoring of landings, the control of transport of products, logbooks and biological sampling carried out by observers on board. The data obtained through this system supported the study on the biology, fisheries and alternatives for the conservation of hammerheads in Ecuador (adopted in the Ministerial Accord No 116 of 2013). Data on size/age composition, maturity, critical habitats and abundance trends are available for hammerheads for the period of 2003 to 2010. There are no stock assessments for the listed species in Ecuador.

Monitoring, Control and Surveillance (MCS) capacity

The fisheries MCS system employs logbooks, observers on board, VMS, dockside monitoring and sea/port inspections. Only ten percent of the longline fleet is covered by observers (vessels with more than 20 tonnes GRT).

Legal acquisition findings

Legislation

Relevant fisheries legislation is revised and summarized in the Management Regime section and in Table 54. It includes the Law of Fisheries and Fisheries Development (Law No. 3 of 1985) and its regulatory norm (Decree No. 3 198 of 2002), and specific norms for shark fisheries (Executive Decree No. 486 of 2008; Ministerial Accord No. 093 of 2010; Ministerial Accord No 116 of 2013 and the Resolution No. 011-2000 of 15 November 2000). Ecuador ratified the CITES Convention through the Accord No. 77 of 27 January 1975. According the evaluation conducted by the CITES Secretariat[34], the country legislation does not meet all the minimum requirements for implementation of CITES (Category 2).

Species identification

Field guides for the identification of fins and carcasses of *S. zygaena* and *S. lewini* were produced as part of the NPOA-Sharks. Other guides and manuals for the identification of species are also available (e.g. Martinez-Ortiz, 2010). Considering that the country reports species-specific landings of hammerheads, threshers, silky and manta rays, it can be concluded that the country has adequate capacity for identifying the listed species.

Traceability

A traceability system is in place and has been used to verify the origin and legality of shark (and other resources) products in trade. The landings of artisanal and industrial vessels are monitored by 67 inspectors distributed in 11 landing ports. For each landing event a Certificate of Monitoring and Control of Landings is issued, containing information on the catches, type of fishery, fishing gears and effort. During the landing inspectors receive the logbooks filled by captains and verify if fins were landed attached to the body and other

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regulatory measures. VMS data is also used to verify if vessels (> 20 tonnes GRT) operated in areas allowed by the regulations. The Certificate of Monitoring and Control of Landings is the base to issue the Mobilization Guides (Guías de movilización), which is the document that allows the transport of products in the country. The control of the legality of exports is carried out based on the Mobilization Guides.

Institutional collaboration

The Vice-ministry of Aquaculture and Fisheries of the Ministry of Agriculture, Livestock, Aquaculture and Fisheries is the main institution responsible for the management of capture fisheries. The Ministry of Environment is the CITES management authority. The country has designated diverse institutions as Scientific Authorities, including the Charles Darwin Foundation, the National Fisheries Institute and several universities. No information could be obtained on the level of collaboration and interaction among these institutions for the implementation of the listings.

The country participated in the Regional workshop for the Strengthening of Capacities for making NDF, organised by the Department of Interior of the United States in 6 September 2013.

As a member of the Comisisión Permanente del Pacífico Sur (CPPS, together with Chile, Colombia and Peru), Ecuador has engaged in different regional initiatives for the management and conservation of sharks organised by CPPS since 2006 (OLDEPESCA, 2011). The CPPS has organised national workshops to support the development of NPOA-Sharks, developed a Regional Plan of Action for Sharks in 2009 and established a Technical Scientific Committee (CTC) responsible for supporting the CPPS in the implementation of the Regional Plan. The CTC has been meeting annually since 2009. CPPS has also organised different training courses on species identification, sampling methodologies and population dynamics of sharks to develop the capacity of member countries. The organization also produced an identification guide for the sharks commonly found in the Southeast Pacific (Martinez-Ortiz, 2010).

A project was also elaborated under OLDEPESCA to enable member countries to develop a stable and robust management system to ensure conservation and management of sharks and their long-term sustainable use (OLDEPESCA, 2011). The project would run for five years, during which the following actions would be implemented: i) research on shark biology; ii) creation of a reliable database of fisheries of these species; iii) information sharing and communication among stakeholders, especially producers and all players who are connected and interact throughout the production chain; iv) consolidation of regulations, which in the best case would follow a similar approach for the whole region; v) capacity building related to accountability, awareness, management and species identification and; vi) the establishment of a program to control and monitoring of these fisheries to avoid breach of the regulations and to ensure sustainable use. No updated information on the status of this project could be obtained.

Finally, as member of IAATC, Ecuador is required to comply with shark conservation and data reporting measures adopted regionally. With appropriate compliance, these measures could contribute to the conservation of the listed species as well as to an improved understanding of their status in the Eastern Pacific Region.

Mexico

SUMMARY INFORMATION ON SHARK FISHERIES AND TRADE

More than 180 species of sharks and rays occurs in the Pacific and Gulf of Mexico coasts, and many are caught by commercial fisheries (both as target and bycatch). The species are caught in three main types of fisheries (PROY-NOM-059-ECOL-2000): small-scale fisheries that operate in coastal waters of the Pacific and Gulf of Mexico, using vessels with less than 10.5 m; medium-scale fisheries, with vessels between 10 and 27 m, operating also along both coasts but mainly in coastal waters of Tamaulipas and Veracruz, Sonda de Campeche and Quintana Roo, and in the Gulf of California and Gulf of Tehuantepec, in the littoral of the Pacific Ocean; and large-scale offshore fisheries, with vessels with more than 27 m, which operate in coastal and offshore waters of the EEZ in the Pacific Ocean. Small-scale fisheries account for about 40 percent of the total catches of sharks and rays, while medium and large-scale fisheries are responsible for 60 percent of the production. No information could be obtained on the main types of fisheries catching the listed species of sharks and manta rays. Mexico has been reporting landings of hammerheads of about 540 tonnes/year and of bigeye thresher of 56 tonnes/year in recent years (Figure 31). There are no records of the other listed species in the FAO database, although catches of silky sharks are also reported nationally (Figure 32). Total shark and ray catches increased steadily since the mid-1950 and reached a peak of 45 205 tonnes/year in 1996. A general declining trend was verified since then, with recent landing in the order of 34 000 tonnes/year. The total shark and rays catches represent about 3 percent of the national marine capture fisheries production (Figure 31).

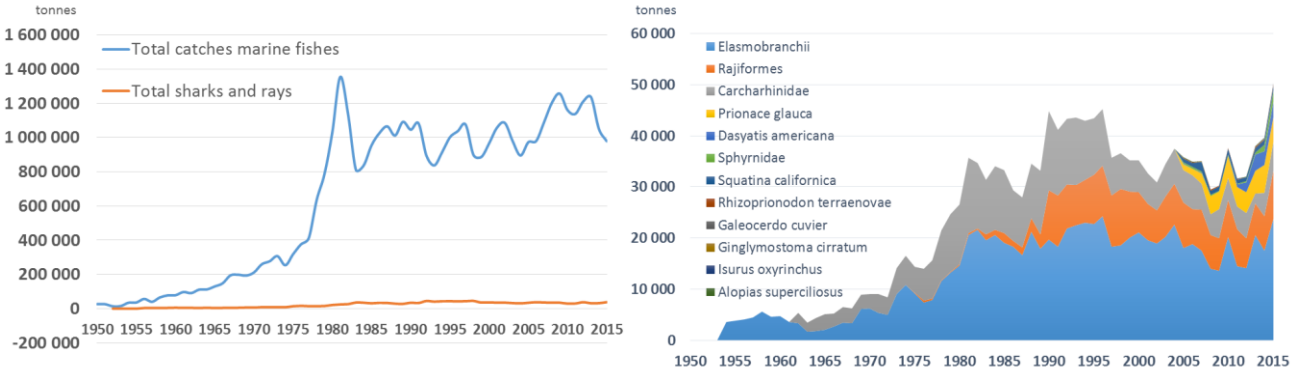


Figure 31. Marine capture fisheries production and the composition of the shark catches of Mexico (Source: FAO, 2017a).

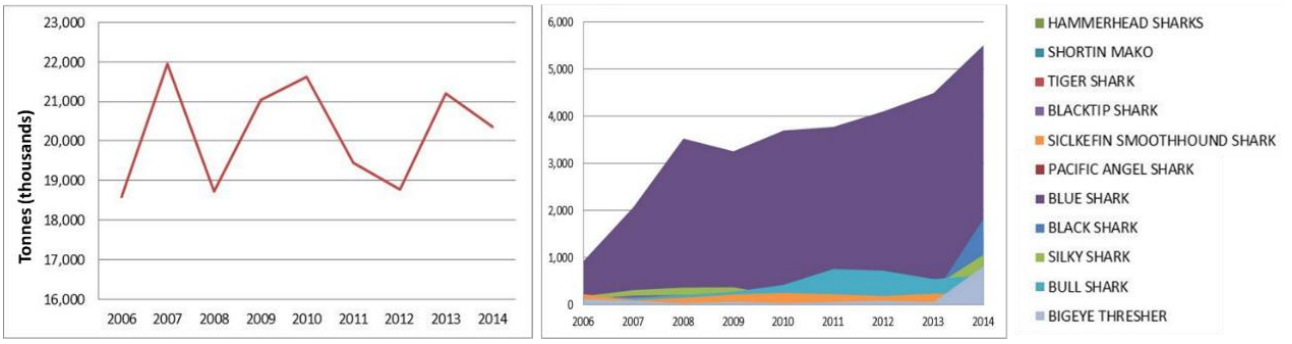


Figure 32. Marine capture fisheries production and the composition of the shark catches of Mexico [Source: Statistical Yearbook of Fisheries and Aquaculture (CONAPESCA)]

Table 55 reports the available shark trade data reported by Mexico to FAO. Mexico is a major producer of sharks and an important market for shark meat. It supplies its consumer base through a combination of imports and domestic production. A large proportion of imports probably consists of foreign distant-water fleet catches landed directly in Mexican ports or in Costa Rican ports before exportation to Mexico. Mexico ranks as the world's sixth-largest shark producer and sixth-largest importer in volume terms (Dent and Clarke, 2015). Its

shark meat import volumes peaked in 2003, reaching more than 10 000 tonnes and have been falling to 2 500 tonnes in 2013. There is no information on the relative importance of the trade in the listed species. According to the Norma Oficial Mexicana (NOM-029-PESC-2006), 90 percent of the shark catches are consumed domestically. Dent and Clarke (2015) reported and average annual shark fin imports of 5 650 tonnes USD8.3 million from 2000 to 2011. Overall the trade in sharks is relatively minor component of the trade in marine fisheries commodities.

Table 55. Average (2008 – 2013) trade flow of shark products from Mexico (FAO, 2016c).

Commodity (average 2008-2013)	Export		Import	
	Tonnes	USD'000	Tonnes	USD'000
Rays and skates (Rajidae), fresh or chilled	2	3		
Rays and skates (Rajidae), frozen	50	49	0	0
Shark fins, dried, whether or not salted, etc.	88	2 257		
Sharks nei, fresh or chilled	108	159	227	381
Sharks nei, frozen	101	93	3 480	6 524
Total sharks commodities	**348**	**2 560**	**3 706**	**6 905**
Total all marine fisheries commodities	**104 984**	**268 213**	**148 189**	**428 182**

Commodity (average 2006-2014[1])	Annual Average Export		Annual Average Import	
	Tonnes	*USD'000*	*Tonnes*	*USD'000*
Total (All sharks)	**691**	**12 074**	**4 139**	**7 559**

Table 56. Trade flow of shark products from Mexico from 2006 to 2014 [Source: National Comission of Aquaculture and Fishing (CONAPESCA) & Secretariat of Finance and Public Credit (SHCP)].

ASSESSMENT OF NATIONAL CAPACITY TO IMPLEMENT CITES REQUIREMENTS

The assessment of the national capacity related to most criteria was not attempted because of the lack of information.

Non-detriment findings

Management regime

Fisheries are regulated by Article 27 of the Political Constitution of the United Mexican states and by the 2007 General Fishing Law for Sustainable Fisheries and Aquaculture and the Regulations rooted in its predecessor (1992). The 2007 Law uses an integrated sector development approach; it establishes entry controls, technical measures, TACs and quotas, and MCS and enforcement. Mexico regulates shark finning and prohibits the exclusive use of shark fins and landing of fins without the bodies on board (Norma Oficial Mexicana NOM-029-PESC-2006). Three shark species (Basking shark (*C. maximus*), great white shark (*C. carcharias*) and whale shark (*R. typus*) are listed as threatened by the Rule on Environmental Protection (Norma Oficial Mexicana PROY-NOM-059-ECOL-2000). In addition, the Rule on Responsible Fisheries of Sharks and Rays from 2006 (Norma Oficial Mexicana NOM-029-PESC-2006; amended in 2011) prohibits retention of 12 species (*R. typus*, *C. maximus*, *C. carcharias*, *Pristis perotteti*, *P. pectinata*, *P. microdon*, *M. birostris*, *Mobula japonica*, *M. thurstoni*, *M. munkiana*, *M. hypostomata* and *M. tarapacana*), and defines protected areas and seasons, gear restrictions and reporting requirements. The NPOA-Sharks was adopted in 2004. It lays out a set of guidelines and permanent research programs, regulation, monitoring and education, to organize and optimize forms of utilization and conservation of the species in national waters. Mexico has also adopted an NPOA IUU. The country is a member of ICCAT, IATTC, a Cooperating Non-contracting Party of WCPFC and of OLDEPESCA. Table 57 summarizes the main management measures of relevance to the recently listed species of sharks and manta rays.

Table 57. Management measures of relevance to shark fisheries in Mexico. The effectiveness of these measures in addressing the known sources of mortality is noted.

Management measures	Description	Effectiveness
Species prohibitions	Capture and retention of dead or alive whale shark (*R. typus*), Basking shark (*C. maximus*), Great white shark (*C. carcharias*) and manta rays (*M. birostris, Mobula japanica, M. thurstoni, M. monkiana, M. hypostomata* y *M. tarapacana*) are prohibited (NOM-029-PESC-2006) Total ban of Great white shark (*C. carcharias*) within all federal marine territory (DOF 27/01/2014). Catch, retention, transport and landing of oceanic white tip shark (*C. longimanus*) by Tuna fisheries is prohibited (NOM-001-SAG/PESC-2013). Retention of protected sharks and rays or within ban season and also an annual 20 percent bycatch limit for longline tuna fishing in the Gulf of México for the following species as a group: atlantic bluefin tuna, billfishes and sharks (NOM-023-SAG/PESC-2014). Mexico is member of IATTC and ICCAT. Therefore, Mexican vessels observe the reservation and management measures for sharks of these organizations during their pelagic fisheries activities, such as regulations specific for hammerhead sharks (Sphyrna spp.), oceanic whitetip shark (*C. longimanus*), thresher sharks (*Alopias* spp.) silky shark (*C. falciformis*) and mobulids rays (Mobulidae).	**Low – medium.** The prohibition of catch and retention of several listed species can mitigate mortality from target fisheries and also increase release of individuals in bycatch fisheries. The effect of the latter will dependent on the level of post-release mortality..
Spatial restrictions	Areas considered as shark and manta refugees, as well as areas banned in certain periods are defined in the NOM-029-PESC-2006, in the Pacific and Gulf of Mexico.	**Low.** Difficult to evaluate effectiveness without information on the main types of fisheries catching the listed species of sharks and manta rays. However in general the size of protected areas is small compared to the distribution range of the species.
Temporal restrictions	CONAPESCA, through the Official Journal of the Federation (DOF), published the shark-fisheries ban, including specific areas and periods, according with the available information provided by INAPESCA (ex. DOF 11/07/12; DOF 23/07/13; DOF 15/05/2014).	**Unknown.** Difficult to evaluate effectiveness without information on the main types of fisheries catching the listed species of sharks and manta rays.

Management measures	Description	Effectiveness
Product form restrictions	Finning as the main use of shark is prohibited, as well as landing fins without the bodies (NOM-029-PESC-2006). Finning of shark bycatch in longline Tuna fisheries in the Gulf of Mexico and Caribbean Sea is also prohibited (NOM-023-SAG/PESC-2014). Required full utilization of shark catches and prohibited finning by applying a 5 percent fin-to-body weight ratio for sharks on board vessels (IATTC Resolution C-05-03 of 2005; ICCAT Recommendation 04-10).	**Low.** Sharks seem to be fully utilized in Mexico, being consumed locally and/or exported. The banning of finning alone would create little incentive to release sharks incidentally caught.
Participatory restrictions	Licenses and authorizations are required for all types of fisheries and specific licenses are needed for fishing sharks and rays, all authorized fishing gears must comply with the NOM 029 (NOM-029-PESC-2006).	**Low.** Licenses on their own do not guarantee the control or reduction of fishing mortality. They have a higher effectiveness when combined with other technical measures.
Fishing capacity	According to the NOM-029-PESC-2006 and the National Fisheries Charts (DOF/2000-2012) the total fishing effort authorized for the capture of sharks and rays should not increase.	**Unknown.** Difficult to evaluate effectiveness without information on the main types of fisheries catching the listed species of sharks and manta rays.
Gear restrictions	NOM-029-PESC-2006 includes gear regulations and defines specific gear restrictions and gear prohibitions applicable to small, medium and large-scale fisheries for sharks by specific regions. NOM-023-SAG/PESC-2014 and NOM-001-SAG/PESC-2013 defines specific restrictions applicable to Tuna fisheries, where shark bycatch occurs.	**Unknown.** Difficult to evaluate effectiveness without information on the main types of fisheries catching the listed species of sharks and manta rays.

Supporting information

During the last decade, Mexico has started to report a few species of sharks to FAO. However, in 2010 about 80 percent of the catches were reported at aggregated taxonomic categories (order and above), about 10 percent at family level and only about 10 percent at species level (Fischer *et al*., 2012). Of the listed species, hammerheads, silky and bigeye thresher shark are segregated in the catch statistics (Figure 31). According to Fischer *et al*. (2012) investigations were underway to determine and protect critical habitats with emphasis on shark populations. A statistical database on sharks and a national scientific observer programme were being developed. Also, shark tagging studies were conducted. No specific information could be obtained on the availability of biological parameters and stock assessments for the listed species of sharks and manta rays (Annex 3).

In July 2015, CONABIO (National Commission for the Knowledge and Use of Biodiversity) as CITES Scientific Authority, carried out a national workshop ("Workshop to Evaluate Productivity, Susceptibility and

Management on Mexican sharks listed on Appendix II of CITES"), as outcome, improved information to formulate NDF is available. In 2015 CONABIO (CITES-SA) had issued 47 NDF (16 for *S. lewini*, 20 for *S. mokarran* and 11 for *S. zygaena*).

Monitoring, Control and Surveillance (MCS) capacity

According to the Norma Oficial Mexicana (NOM-029-PESC-2006), all vessels licensed to fish sharks and rays are required to:

- Small-scale fisheries: keep a monthly control of catches by species in the logbook, which must be submitted to the authorities every month (including records of the incidental catches and release of prohibited species);
- Vessels with more than ten tonnes GRT and/or with more than ten m (medium and large scale): keep a daily control of catches by species in the logbook, which must be submitted to the authorities as defined in the Regulation of the Law of Fisheries. These vessels must also participate in the System of Satellite Monitoring and Localization of Vessels.
- Participate in the program of observers on board.

No information could be obtained on the level of implementation of the above norms. CONAPESCA (National Comission of Aquaculture and Fishing) is implementing a National Observers Program with certified scientific observers monitoring medium and large (industrial) fleet in the Pacific Ocean.

Legal acquisition findings

Legislation

Fisheries are regulated by Article 27 of the Political Constitution of the United Mexican states and by the 2007 General Fishing Law for Sustainable Fisheries and Aquaculture and the Regulations rooted in its predecessor (1992). Specific regulations for sharks fisheries are provided by the Norma Oficial Mexicana (NOM-029-PESC-2006 amended in 2011) and by the Rule on Environmental Protection (Norma Oficial Mexicana PROY-NOM-059-ECOL-2000). As member of IATTC, ICCAT and Cooperating Non-contracting Party of WCPFC, Mexico has to comply with the shark conservation and management measures established by these organizations. Table 57 makes a summary of all the relevant norms regulating the fisheries for sharks. The lack of specific information on the types fisheries catching sharks make difficults the evaluation of this criterion. According the evaluation conducted by the CITES Secretariat[35], the country legislation meets all the minimum requirements for implementation of CITES (Category 1).

Species identification

According to Fischer *et al*. (2012), species identification guides for coastal sharks of the Pacific and the Gulf of Mexico were produced and training workshops for their use were conducted for the industry. In addition, reporting requirements for sharks have been strengthened and electronic logbooks were developed that foresee the recording by species and of the main shark species found in different coastal regions of Mexico. A FAO regional guide for species identification (including sharks) exists for the Western Central Atlantic (Carpenter, 2002) and the Eastern Central Pacific (Fischer *et al*., 1995). No information could be obtained on the current capacity to identify species in the products in trade. In 2014, CONAPESCA organised several workshops in the states of the Gulf of Mexico about applicable regulations, both nationally and internationally. CITES Enforcement authority (PROFEPA) are testing National ID Guides as well the "iSharkFin" software. CITES Enforcement Authority are sharing DNA samples as part of a pilot test of the Barcode of Life Project coordinated by UNAM and MEXBOL.

Traceability

No information could be obtained on existing traceability mechanisms that could assist in the verification of the origin and legality of shark and ray products along the supply chain. Mexico is a member of the IATTC, which implies adherence to the adopted management measures including the requirement to establish a bigeye tuna statistical document program (IATTC Resolution C-03-01) where all imports and re-exports of bigeye are to be accompanied by a Statistical Document. As a party to ICCAT, Mexico has also to comply with the catch documentation schemes adopted by the organization for the tunas and swordfish. Although these measures are directed to tunas and swordfish, their implementation would facilitate the application of similar schemes for sharks caught in association with tuna fisheries. The level of implementation of these measures is not known.

Institutional collaboration

The agency responsible for fisheries management, monitoring and enforcement is the National Commission of Aquaculture and Fisheries (CONAPESCA) of the Secretary of Agriculture, Livestock, Rural Development, Fisheries and Food. The CITES Management Authority is the Secretary of Environment and Natural Resources (SEMANART) and the Scientific Authority is the National Commission for the Knowledge and Use of Biodiversity (CONABIO) of SEMANART. No specific information could be obtained on the level of collaboration between the national fisheries and CITES authorities for the implementation of the CITES listings of commercially exploited species. Mexico created in 1997 the Inter-ministerial Committee for Monitoring the Convention in Mexico. The Committee includes representatives from CITES Authorities (Dirección General de Vida Silvestre, Comisión Nacional para el Conocimiento y Uso de la Biodiversidad, Procuraduría Federal de Protección del Ambiente), the Instituto Nacional de Ecología, the Comisión Nacional de Acuacultura y Pesca (CONAPESCA), the Instituto Nacional de la Pesca, the Comisión Nacional Forestal, the Dirección General de Gestión Forestal y de Suelos, the Unidad Coordinadora de Asuntos Internacionales,

35 CoP17 Doc. 22 Annex 3 (Rev. 1) Status of legislative progress for implementing CITES (updated on 1 September 2016).

the Secretaría de Relaciones Exteriores, the Comisión Nacional de Áreas Naturales Protegidas and the Secretaría de Economía. The Committee has fostered cooperation between different government agencies relating to the management, use and conservation of the species included in the Appendices of CITES (www.biodiversidad.gob.mx).

As a member of ICCAT, IATTC and Cooperating Non-contracting Party of WCPFC, Mexico is engaged in discussion and deliberations concerning the conservation and management of sharks in the jurisdiction areas of these RFBs. With appropriate compliance, these measures could contribute to the conservation of the listed species as well as to an improved understanding of their status in the Eastern Pacific and Wider Caribbean region.

A project was also elaborated under OLDEPESCA to enable member countries to develop a stable and robust management system to ensure conservation and management of sharks and their long-term sustainable use (OLDEPESCA, 2011). The project would run for five years, during which the following actions would be implemented: i) research on shark biology; ii) creation of a reliable database of fisheries of these species; iii) information sharing and communication among stakeholders, especially producers and all players who are connected and interact throughout the production chain; iv) consolidation of regulations, which in the best case would follow a similar approach for the whole region; v) capacity building related to accountability, awareness, management and species identification and; vi) the establishment of a program to control and monitoring of these fisheries to avoid breach of the regulations and to ensure sustainable use. No updated information on the status of this project could be obtained.

Panama

SUMMARY INFORMATION ON SHARK FISHERIES AND TRADE

Figure 33 describes the trend in shark and ray catches and the total marine capture fisheries production reported to FAO. Panama started to report landings of sharks and rays in 1990. The data shows a high variability in catches, which may reflect reporting and monitoring problems. A large proportion of the catches are reported in highly aggregated taxonomic categories and it is impossible to evaluate the relative importance of the listed species. The highest catches of sharks and rays (6 127 tonnes) were recorded in 2002. Overall the group has a minor importance in national fisheries, accounting for 1.3 percent of the total marine capture fisheries production in recent years.

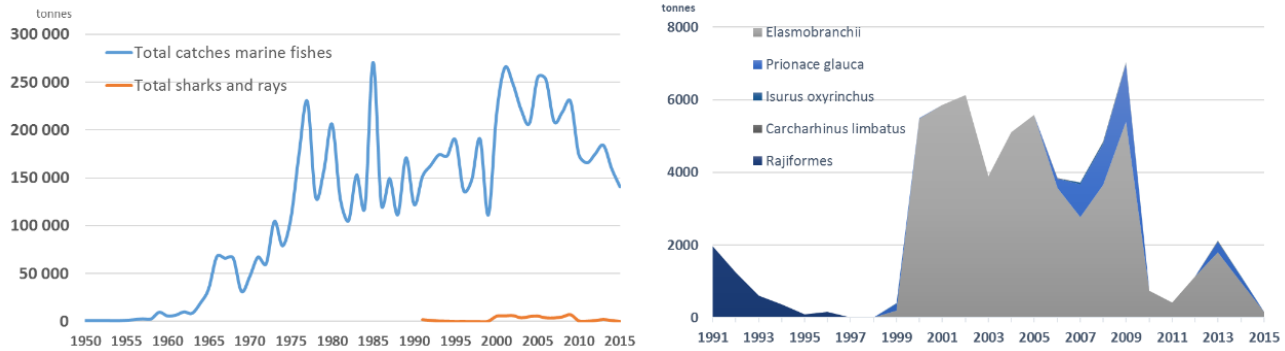


Figure 33. Marine capture fisheries production and the composition of the shark catches of Panama (Source: FAO, 2017a).

Until recently, Panama was a relatively large producer and exporter of shark meat and fins, but trade and capture volumes have declined significantly in recent years. It ranks as the world's seventh-largest shark meat exporter from 2000 to 2011 (Dent and Clarke, 2015), but posted total exports of only 374 tonnes in 2013. It exports primarily to the United States of America. From 2008 to 2013, it recorded average annual shark meat exports of 1 699 tonnes, valued USD 3.2 million/year (Table 58). The average export of fins (dried, whether or not salted) in the same period was 45 tonnes/year, valued at USD 1.7 million/year. No information could be obtained on the uses and trade in the listed species of sharks and manta rays.

Table 58. Average (2008 – 2013) trade flow of shark products from Panama (FAO, 2016c).

Commodity (average 2008-2013)	Export		Import	
	Tonnes	USD'000	Tonnes	USD'000
Rays and skates (Rajidae), fresh or chilled	6	10		
Shark fins, dried, whether or not salted, etc.	45	1 705		
Sharks nei, fresh or chilled	129	284	0	0
Sharks nei, frozen	1 564	2 936	33	44
Total sharks commodities	**1 743**	**4 934**	**33**	**44**
Total all marine fisheries commodities	**51 448**	**168 069**	**13 104**	**37 244**

ASSESSMENT OF NATIONAL CAPACITY TO IMPLEMENT CITES REQUIREMENTS

The assessment of the national capacity was not attempted because of the lack of information.

Peru

SUMMARY INFORMATION ON SHARK FISHERIES AND TRADE

Sharks are one of the target resources of small-scale fisheries in Peru (Gonzalez-Pestana *et al*., 2014). The small-scale longline fishery has two distinct seasons, one targeting sharks (March to November) and another targeting dolphinfish (*Coryphaena hippurus*; December to February) (Doherty *et al*., 2016). Catches of sharks in this fishery was represented by 70.6 percent of blue sharks (*Prionace glauca*), 28.4 percent short-fin mako sharks (*Isurus oxyrinchus*), and 1 percent were other species (including thresher (*A. vulpinus*), smooth hammerhead (*S. zygaena*), porbeagle (*Lamnus nasus*), and other Carcharhinidae species (*Carcharhinus brachyurus*, *C. falciformis*, *Galeorhinus galeus*). Sphyrnidae and *Mobula* spp. are also target resources in other small-scale fisheries, while manta rays are incidentally caught in a direct fishery for *Mobula* spp. According to a study by Heinrichs *et al*. (2011) about 150 manta rays are caught per year in Peru. A large proportion of the catches reported to FAO consist of smooth-hounds (*Mustelus* spp.) which are reported at genus level. Other chondrichthyes are reported mainly by highly aggregated categories (Figure 34). The total catches of sharks and rays oscillated markedly since 1950, with peaks of production in 1968 (24 700 tonnes), 1973 (21 500) and 1984 (34 428 tonnes). In the last two decades catches have oscillated around an average of 10 000 tonnes/year, increasing to 16 922 in 2015, which repersent less than 0.5 percent of the total marine fisheries capture production. Overall national catch figures for sharks would be greatly increased when considering the effort of an extensive, yet poorly studied, small-scale gillnet fishery that also operates in Peru (setting over 100,000 km of nets per annum), specifically targeting sharks and rays (Alfaro-Shigueto *et al*., 2010).

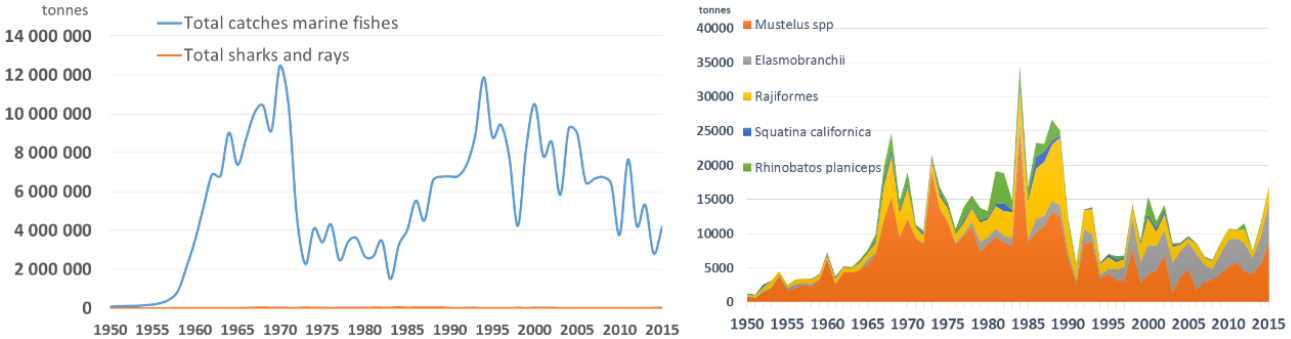


Figure 34. Marine capture fisheries production and the composition of the shark catches of Peru (Source: FAO, 2017a).

The species are consumed locally, being the fins the only product in trade (mostly to China, Hong Kong SAR, China and a small portion to Japan). In spite of the reported catches of manta rays, Heinrichs *et al*. (2011) indicated that no gill rakers were exported from Peru. Table 59 summarizes the available trade statistics reported to FAO. Shark meat (fresh, chilled and frozen) is the main product both exported and imported. According to the available data, Peru exported 163 tonnes/year of fins in recent years, valued at USD 9.3 million per year, and 883 tonnes of shark meat. Dent and Clarke (2015) reported a large rise in imports of shark meat from Japan in recent years with a total average import of shark meat from 2008 to 2013 of 3 835 tonnes valued USD 2.2 million/year. The total export volume and value is however of minor importance when compared to the total export of marine fisheries commodities.

Table 59. Average (2008 – 2013) trade flow of shark products from Peru (FAO, 2016c).

Commodity (average 2008–2013)	Export		Import	
	Tonnes	*USD'000*	*Tonnes*	*USD'000*
Rays and skates (Rajidae), fresh or chilled			53	6
Shark fins, dried, whether or not salted, etc.	163	8 207	59	545
Sharks nei, fresh or chilled	1	2	2 039	248
Sharks nei, frozen	883	1 575	1 743	1 940
Total shark commodities	**1 046**	**9 784**	**3 894**	**2 739**
Total all marine fisheries commodities	**1 939 382**	**2 744 917**	**79 633**	**139 002**

Non-detriment findings

Management regime

Fisheries management is mainly based on the General Fisheries Law (Decree Law No. 25 977) and numerous by-laws. Measures deal with fishery entry regimes, fleet and processing capacities, technical measures, TACs, scientific assessments and MCS. The Ministerial Resolution N° 058-2002-PE of 08 February 2002 established a list of highly migratory resources found in Peruvian waters, including *C. longimanus* and *S. zygaena* (*S. lewini* is not listed in the resolution). The Decree N° 032-2003-PRODUCE of 4 November 2003 approved the Regulations for the Management of Tunas and Tuna-like species aimed at the rational and sustainable use of these resources through the application management and conservation measures. The Decree includes ten species of sharks, including *C. longimanus* and *S. zygaena.* Shark landings in Peru are regulated by the Ministry of Fisheries through the establishment of minimum landing sizes (MLS) for some elasmobranch species (Diario Oficial El Peruano 2001; Decreto Supremo N° 012-2001-PE; blue sharks (*Prionace glauca*): 160 cm total length; short-fin mako sharks (*Isurus oxyrinchus*): 170 cm total length). By-catch for three deep water chondrichthyes (*Hydrolagus* sp, *Bathyraja* sp and *Somniosus pacificus*) is regulated by the Resolución Ministerial No. 236-2001-RE. Enforcement of these regulations, however, has not been fully implemented, and awareness of these regulations among fishermen was considered limited in the recent past (Gilman *et al*., 2008). In 2015, Peru has approved strong regulations to protect the manta rays, prohiting fisheries of *M. birostris* in Peruvian waters (Resolución Nº 441/15/PRODUCE). More recently the adoption of the Resolución Nº 008/16/PRODUCE established the temporal closure of fisheries for *S. zygaena* from 11 March to 31 December of each year. In 2016, the Decreto Supremo Nº 021/16/PRODUCE prohibits finning, requiring the landing of sharks carcasses with the fin entirely or partially attached. The NPOA-Shark was drafted in 2005 and approved in 2014 through the Decree N° 002-2014-PRODUCE. National workshops and inter-institutional coordination were carried out to ensure the implementation of the plan. The country has signed but not yet ratified the Port State Measures Agreement. Peru is a member of IATTC, CCAMLR, COPESCAAL, OLDEPESCA, and CPPS. As a member of the CPPS, Peru has adopted the 2009 RPOA-Sharks developed by the organization with the goal to develop sustainable EAF-based fisheries, establish measures for management and administration; ensure complete utilization of shark bodies and implementing MCS and enforcement measures. Table 60 summarizes the main regulations in place for shark fisheries.

Table 60. Management measures of relevance to shark fisheries in Peru. The effectiveness of these measures in addressing the known sources of mortality is noted.

Management measures	Description	Effectiveness
Species prohibitions	Prohibited the extraction of Giant manta ray (*M. birostris*) in any art or fishing gear or other instrument, in marine waters of the Peruvian jurisdiction (Resolution No. 441-2015-PRODUCE). Peru is member of IATTC and Peruvian vessels follows the resolutions hereunder: - prohibit retaining onboard, transshipping, landing, or storing, in part or whole, carcasses of silky sharks (*C. falciformis*) caught by purse-seine vessels in the IATTC Convention Area. Require all longline vessels whose fishing licences do not include sharks as a fishing target but catch sharks incidentally, to limit bycatch of silky sharks to a maximum of 20 percent of the total catch by fishing trip in weight. Require their multi-species fisheries using surface longlines1 to limit the catch of silky sharks of less than 100 cm total length to 20 percent	**Low – Medium**: prohibition of manta and whitetip can reduce mortality in target small-scale fisheries. The impacts of norms concerning catches in purse seine fisheries is unknown.

Management measures	Description	Effectiveness
	of the total number of silky sharks caught during the trip (IATTC C-16-06, 2016). - require purse-seine vessels flying their flag to follow safe release requirements for all sharks, except those retained aboard the vessel (IATTC C-16-06, 2016). - prohibit longline vessels flying their flag and targeting tuna or swordfish in the Convention Area from using "shark lines". The IATTC scientific staff shall develop a workplan, for completing full stock assessments for the silky shark (*C. falciformis*) and hammerhead sharks (i.e., *S. lewini*, *S. zygaena* and *S. mokarran*) (C-16-05, 2016). - prohibit retaining onboard, transshipping, landing, storing, selling, or offering for sale any part or whole carcass of mobulid rays (which includes manta rays and mobula rays) (IATTC C-15-04, 2015); - Prohibited targeting and retention of oceanic Whitetip sharks by fisheries regulated by IATTC. Individuals caught to be released alive, to the extent practicable (Resolution IATTC C-11-10, 2011) CCALMR Conservation measure 32-18 (2006) on the conservation of sharks, prohibition of direct fishing and release alive of any bycatch of shark taken accidentally in other fisheries.	
Minimum size	Minimum catch size of Blue shark (*Prionace glauca*) to 160 cm total length (15 percent maximum tolerance of juveniles) (Resolution No. 209-2001-PE). Minimum catch size of Shortfin mako (*Isurus oxyrinchus*) to 170 cm total length (15 percent maximum tolerance of juveniles) (Resolution No. 209-2001-PE). Minimum catch size of Humpback smooth-hound (*Mustelus whitneyi*) to 60 cm in total length (20 percent maximum tolerance of juveniles) (Resolution No. 209-2001-PE). Minimum catch size of Speckled smooth-hound (*Mustelus mento*) to 60 cm in total length (20 percent maximum tolerance of juveniles 20 percent) (Resolution No. 209-2001-PE). Minimum catch size of Spotted houndshark (*Triakis maculate*) to 60 cm in total length (20 percent	**Low.** Measure would provide little protection to juvenile whitetip and silky sharks, as maturity sizes for these species are likely above 150 cm TL.

Management measures	Description	Effectiveness
	maximum tolerance of juveniles 20 percent) (Resolution No. 209-2001-PE). Minimum catch size of Carcharhinus sharks (*Carcharhinus* spp.) to 150 cm total length (15 percent maximum tolerance of juveniles) (Resolution No. 209-2001-PE)	
Product form restrictions	Decreto Supremo Nº 021/16/PRODUCE prohibits finning, requiring the landing of sharks carcasses with the fin entirely or partially attached Required full utilization of shark catches and prohibited finning by applying a 5 percent fin-to-body weight ratio for sharks on board vessels (IATTC Resolution C-05-03 of 2005).	**Low.** Sharks seem to be fully utilized in Peru, being consumed locally and/or fins exported. The banning of finning would create little incentive to release sharks caught in small-scale fisheries.
Participatory restrictions	Licenses and authorizations required for all types of fisheries.	**Low.** Licenses on their own do not guarantee the control or reduction of fishing mortality. They have a higher effectiveness when combined with other technical measures.
Gear restrictions	Minimum mesh size for sharks and rays gillnet fisheries (200 - 330 mm) (Resolución Ministerial No. 209-2001-PE).	**Low.** Difficult to evaluate effectiveness without information on the types of fisheries catching the listed species of sharks and manta rays. If gillnets are used, the minimum mesh sizes would reduce the capture of small juveniles of *S. lewini*.
Temporal restrictions	Closed seasons and fishing seasons for Smooth hammerhead (*Sphyrna zyagena*) and catch limits (Resolution No. 008-2016-PRODUCE).	**Low - Medium:** closed seasons and catch limits, if adequately designed and implemented, could help limit the mortality on the species.

Supporting information

Since 2000, through the project "Monitoring System of Artisanal Fisheries", the Instituto del Mar del Peru (IMARPE) is collecting catch data by species (including sharks and rays) from small-scale fisheries in the main landing points from Puerto Pizarro to Vila Vila. From 2005 to 2010, an onboard observer program to collect the catches of sharks in small-scale longline fisheries was conducted in Ilo, in the south of Peru (Doherty et. al., 2014). From 2010, a monitoring programme is in place to record the biological-fisheries indicators of the more important commercial sharks: Blue shark (*Prionace glauca*); Shortfin mako (*Isurus oxyrinchus*) and Smooth hammerhead (*Sphyrna zyagena*). In 2015 two technical reports were published on the population status of *S. zygaena* and *M. birostris* [Juan Canturín Garcia (CITES Management Authority of Peru Ministry of Production) pers. comm.]. However, no other biological information or stock assessment is available for the listed species. The available catch data from artisanal fisheries would be the only data available to monitor trends in the species.

Monitoring, Control and Surveillance (MCS) capacity

No information could be obtained on the level of implementation of mechanisms for the monitoring, control and surveillance of shark fisheries. According to the information provided by Juan Canturín Garcia (CITES Management Authority of Peru Ministry of Production), Peru is implementing a project for the monitoring of small-scale fisheries catches in the main landing ports since 2000. The project seems to have mainly a scientific purpose.

Legal acquisition findings

Legislation

Fisheries management is mainly based on the General Fisheries Law (Decree Law No. 25 977) and numerous by-laws. The main shark-specific regulations, adopted nationally and by relevant RFMOs, are summarized in the Management Regime section and also in Table 60. The Regulations for the Implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in Peru are provided by the Decree Nº 030-2005-AG (amended by the Decree No. 001-2008-MINAM). According the evaluation conducted by the CITES Secretariat, the country legislation meets all the minimum requirements for implementation of CITES (Category 1).

Species identification

Identification guides for the commercial shark species are available. A manual for the identification of sharks was also prepared under CPPS RPOA-Sharks (e.g. Martinez-Ortiz, 2010) and in 2015 a field guide for the identification of sharks in artisanal fisheries was developed by IMARP. No information could be obtained on the current capacity to identify species in the products in trade.

Traceability

No information could be obtained on existing traceability mechanisms (and on the overall MCS systems for small-scale fisheries), that could assist in the verification of the origin and legality of shark and ray products along the supply chain. The country lacks information on the main supply chain for shark products in trade and has only recently started a system of monitoring of small-scale catches in the main landing ports.

Institutional collaboration

Fisheries management is the responsibility of the Ministry of Production through the Office of the Deputy Minister of Fisheries. IMARPE is the leading scientific institution on marine science and fisheries resources. The Ministry of Production, through the General Directory for Fisheries Harvesting and Processing, is also the CITES management authority for aquatic resources. The General Directory for Biological Diversity of the Ministry of Environment is the overall CITES Scientific Authority. IMARPE has been designated Scientific Authority for sharks and rays. In 2016, the Ministry of the Environment (MINAM) in coordination with the Ministry of Production (PRODUCE) organised a capacity building workshop for the implementation of the CITES Appendices of sharks in Peru. As a member of the Comisisión Permanente del Pacífico Sur (CPPS, together with Ecuador, Chile and Colombia), Peru has engaged in different regional initiatives for the management and conservation of sharks organised by CPPS since 2006 (OLDEPESCA, 2011). The CPPS has organised national workshops to support the development of NPOA-Sharks, developed a Regional Plan of Action for Sharks in 2009 and established a Technical Scientific Committee (CTC) responsible for supporting the CPPS in the implementation of the Regional Plan. The CTC has been meeting annually since 2009. CPPS has also organised different training courses on species identification, sampling methodologies and population dynamics of sharks to develop the capacity of member countries. The organization also produced an identification guide for the sharks commonly found in the Southeast Pacific (Martinez-Ortiz, 2010). Also, as a member of IATTC, Peru is involved in discussion and deliberations concerning the conservation and management of sharks in the jurisdiction areas of this RFB.

Uruguay

SUMMARY INFORMATION ON SHARK FISHERIES AND TRADE

Uruguay reports the presence of *S. lewini*, *S. zygaena*, *C. longimanus*, *C. falciformis*, *L. nasus*, *A. vulpinus* and *Manta* spp. in the catches of fisheries operating in national waters and in the high seas. All of them area caught as bycatch in industrial and/or artisanal fisheries; the relative importance of catches in these fisheries is unknown. Hammerheads are caught in industrial pelagic longline fisheries for swordfish and tunas, in industrial bottom trawling fisheries and in small-scale gillnet and bottom longline fisheries for coastal demersal species. Oceanic whitetip and manta rays are caught as bycatch in industrial pelagic longline fisheries for swordfish and tunas, particularly in international waters. Finally, porbeagle and silky shark are caught as bycatch in industrial pelagic longline fisheries for swordfish and tunas and in industrial bottom trawling. porbeagle, thresher and hammerheards are the only CITES species reported in FAO data, and since 2013 they are not recorded any longer (Figure 35). Porbeagle had an average reported landing of 16.8 tonnes/year in recent years. However since 2013 the retention of *L. nasus* on board and its landings and commercialization is prohibited (see Management regime). The overall importance of shark catches is 3.7 percent of the total marine capture fisheries in recent years.

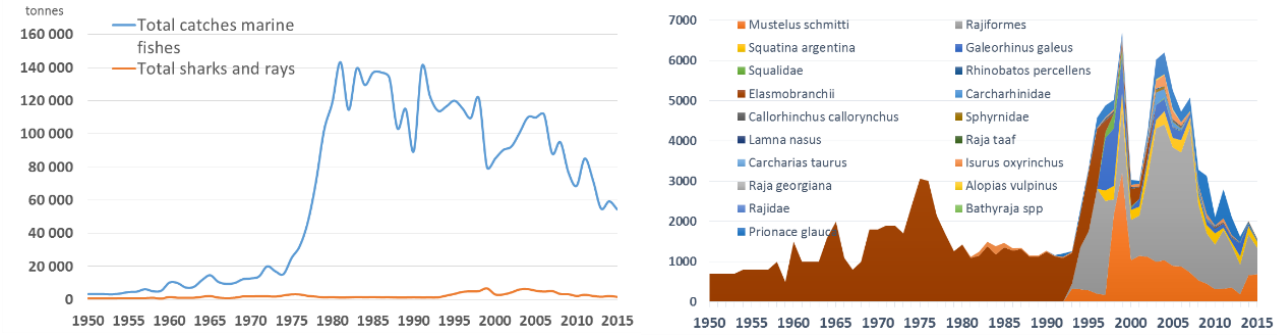


Figure 35. Marine capture fisheries production and the composition of the shark catches of Uruguay (Source: FAO, 2017a).

The trade in shark products to and from Uruguay (particularly meat) is considerable and represent an important share of the total trade in fish commodities (Table 61). Uruguay has become a major importer, processor and re-exporter of shark meat in the last decade. Imports into Uruguay are mainly landings by foreign fleets fishing the surrounding waters. Uruguay produces steaks from headed, gutted and finned carcasses that are then exported to Brazil. It saw rapid growth in shark meat imports and exports from 2005 to a peak in 2009 when it imported 21 717 tonnes, worth USD21 million, and exported 17 223 tonnes, worth USD33.9 million. Since 2009, trade volumes have declined by almost 50 percent. Uruguay's domestic market for shark meat is small, and domestic production of sharks is relatively low (Dent and Clarke, 2015). According to the FAO trade database the country exported an average of 12 703 tonnes/year and imported an average of 8 011 tonnes/year of frozen and chilled sharks and rays in recent years (Table 61). Lower volumes of fins are also in trade. The local consumption of fish products is generally low. According to A. Domingo (pers. comm.), the listed species are only eventually commercialized locally, and none of them are exported from Uruguay.

Table 61. Average (2008 – 2013) trade flow of shark products from Uruguay (FAO, 2016c).

Commodity (average 2008-2013)	Export		Import	
	Tonnes	USD'000	Tonnes	USD'000
Dogfish (Squalidae) and catshark fillets, frozen	48	224	13	45
Rays and skates (Rajidae), fresh or chilled			30	25
Rays and skates (Rajidae), frozen	199	465		
Shark fillets nei, frozen	1 212	3 130	31	207
Shark fins, dried, unsalted	10	147	0	0
Shark fins, dried, whether or not salted, etc.	2	21		
Sharks nei, fresh or chilled	30	25	0	0
Sharks nei, frozen	11 263	26 162	15 991	18 088
Total sharks commodities	**12 763**	**30 174**	**16 065**	**18 365**
Total all marine fisheries commodities	**86 003**	**188 974**	**31 556**	**56 628**

ASSESSMENT OF NATIONAL CAPACITY TO IMPLEMENT CITES REQUIREMENTS

Non-detriment findings

Management regime

The Law on Responsible Fishing and Aquaculture Development (Law Nº 19.175 of 20 December 2013) is the main legal framework for fisheries management in the country. Other complementary regulations include the Decree Nº 149/1997, with regulatory measures for the exploitation and jurisdiction over marine resources, and the Decree Nº 213/1997, which provides for the hygienic and sanitary control of the fishery products. Of particular interest to sharks, Decree Nº 67/2013 establishes conservation measures for *L. nasus*, requiring the live release of individuals and prohibiting their retention on board, landing and commercialization.

Uruguay and Argentina signed the "Tratado del Río de la Plata y su Frente Marítimo" concerning the Rio de la Plata and the corresponding Maritime Boundary. For the implementation of this international agreement several regulations are adopted by the "Comisión Técnica Mixta del Frente Marítimo (CTMFM) " every year for the management of the shared fisheries resources. The more relevant for shark species are:
- Resolución N° 15/2013 - Establishing the prohibition of trawl fisheries in the common area for the protection of cartilagonous fishes.
- Resolución Nº 7/2016 - Establishing the TAC for angel fishes of the genus *Squatina*;
- Resolución Nº 9/2016 - Establishing a pilot study for the evaluation of the proportion of sharks in the bycatch;
- Resolución 5/2017 - Establishing the TAC for rays in coastal and high sea rays and skates for the year 2017.

Uruguay adopted the National Plan of Action for Sharks in 2008. The Plan is currently under revision. The country ratified the Port State Measures Agreement in 2013. Uruguay is a member of the Comisión Técnica Mixta del Frente Marítimo (CTMFM), ICCAT and CCAMLR. Table 62 summarizes the management measures in place that are of relevance to the management and conservation of the listed species.

Table 62. Management measures of relevance to shark fisheries in Uruguay. The effectiveness of these measures in addressing the known sources of mortality is noted.

Management measures	Description	Effectiveness
Species prohibitions	Prohibited the retention on board of porbeagle (*L. nasus*) Individuals incidentally caught to be released alive when possible (Decree Nº 67/2013). Prohibited catch and trade of thresher sharks of the species bigeye thresher shark, oceanic whitetip sharks, hammerhead sharks (except for *S. tiburo*) and silky shark in tuna fisheries regulated by ICCAT (Recommendations 09-07 2009, 10-07 2010, 10-08 2010, 11-08 2011). Moreover, porbeagle should be promptly release unharmed, to the extent practicable (ICCAT Recommendation 13-10 2013). CCALMR Conservation measure 32-18 (2006) on the conservation of sharks, prohibition of direct fishing and release alive of any bycatch of shark taken accidentally in other fisheries.	**Medium – High**. Measures can be highly effective in reducing the mortality if levels of post release mortality are low. porbeagle is protected from all types of fisheries. Whitetip and hammerheads protected in fisheries managed by ICCAT. Their capture in other fisheries (small-scale, bottom trawling, etc.) remain unregulated. No specific measure for manta rays.
Spatial restrictions	Prohibited bottom trawling for the protection of elasmobranchs in the area delimited by the following coordinates: North: 36°S and its intersection with the Exterior Limit of the la Plata River; South: 37°S; West: exterior limit of the Argentinean territorial sea; East: 56°00'W. Measure valid from 1 November 2013 to 31 March 2014 (Resol. CTMFM 15-2013). Prohibited trawling within 7 nautical miles from the coast.	**Low**: area affected by these restrictions are too small to have any substantial effect on species that are widely distributed and migratory. The protection of coastal waters from trawling can reduce pressure on areas normally used by hammerheads for reproduction (no specific information available to quantify its effect).
Product form restrictions	Prohibited finning (5 percent fin to body weight ratio to be applied) (ICCAT Recommendation 04-10).	**Low – Medium**: Measure could encourage release of individuals incidentally caught in tuna and swordfish fisheries. No additional benefit for porbeagle, hammerhead and whitetip, because retention is prohibited.
Participatory restrictions	Fishing access only with licenses and authorizations issues by competent authorities (Law Nº 19.175/2013).	**Low**. Only effective if it is used to reduce or control the entry of new vessels. This does not seem to be the case in Uruguay.

Supporting information

There are different systems for the collection of fisheries data, and at present there are no identified impediments for the monitoring of catches and effort in the main fisheries capturing the listed species of sharks and manta rays. Although the monitoring of catches of small-scale fisheries is considered fragmented and inaccurate (Defeo *et al*., 2011), catches of the listed species by the small-scale sector are likely to be minor compared to the industrial sector (longline and trawling fisheries). In effect, Uruguay records catch (including discards) and effort data for each of the main species of sharks and rays since 1998. Biological parameters are available for all the listed species, including size/age composition (*Sphyrna* spp.; *C. longimanus*; *L. nasus*), maturity (*L. nasus*), fecundity (*Sphyrna* spp. and *L. nasus*), temporal and spatial distribution (all species) and abundance trends (all species) (Annex 3). There is therefore a reasonable amount of information that could support the monitoring of the status of these species in Uruguayan waters. As a member of ICCAT, Uruguay has participated in the attempts by the organization to assess the status of porbeagle in the Southwest Atlantic (ICCAT, 2010).

Monitoring, Control and Surveillance (MCS) capacity

According to the information provided by the Dr. Marcel Calvar [(Ministry of Livestock, Agriculture and Fisheries Natural Renewable Resources Division (RENARE)], the country has a MCS system considered sufficient to ensure compliance with the norms in place for the main fisheries catching the listed species of sharks and manta rays. All fleets are covered by logbooks, VMS and port/sea inspection, while a variable portion of the fleets have observers on board (Annex 4). Although no specific information was provided, the fisheries MCS is likely to be more comprehensive for the industrial sector than to the small-scale sector.

Legal acquisition findings

Legislation

As mentioned above, the three main legislations of relevance to the capture of sharks are the Law on Responsible Fisheries and Aquaculture Development (Law Nº 19.175 of 20 December 2013), the norms for the exploitation and jurisdiction over marine resources (Decree Nº 149/1997), the norms for the hygienic and sanitary control of fishery (Decree Nº 213/1997) and the norms for the conservation of porbeagle shark (Decree Nº 67/2013). As a member of CTMFM, ICCAT and CCAMLR, Uruguay has also to comply with the norms established by these organizations. Of particular relevance to the listed species of sharks are ICCAT resolutions requiring the live release of oceanic whitetip and hammerhead and prohibiting finning (Table 62). At present there are no specific management measures for manta rays.

The Law Nº 14.205 of 4 June 1974 sanctions the entry of Uruguay in CITES. The Ministry of Livestock, Agriculture and Fisheries was designated CITES management authority by the Decree 263/993 of 8 June 1993, while the Ministerial Resolution No. 449/993, of 29 July 1993, has designated the Directorate General of Renewable Natural Resources (DGRNR) of the Ministry of Livestock, Agriculture and Fisheries as the Management Authority and the National Scientific Authority. More recently, the Decree Nº 550/008 regulated the trade in species listed in Appendices I, II and III of CITES. Among other things, the Decree gives power to the DGRNR to amend the annexes of the Decree, which contains the list of species listed in CITES, following decisions of the CITES Conference of the Parties. This decree is viewed as a substantial improvement in the regulation of CITES in the country to ensure compliance with provisions of the Convention. According the evaluation conducted by the CITES Secretariat[36], the country legislation meets all the minimum requirements for implementation of CITES (Category 1).

Species identification

The country has adequate means and capacity to identify the species in the catch and also in the products in trade. Identification manuals are available (e.g. Domingo *et al*., undated) and there is a good level of disaggregation of shark catches by species (Figure 35). The identification of species in the products in trade (mainly meat) would have to rely on the use of DNA techniques.

36 CoP17 Doc. 22 Annex 3 (Rev. 1) Status of legislative progress for implementing CITES (updated on 1 September 2016).

Traceability

Uruguay has taken steps to improve the system of certification of fishery products in recent years, with a focus on the sanitary control. One of the objectives of the FAO project UTF/URU/ 025/URU "Fisheries management in Uruguay" (2007 – 2012) was to support the technical and institutional strengthening of the Inspection Service of DINARA to ensure that exports from Uruguay comply with international requirements for food safety and quality. The current system of sanitary certification of the catches for export ensures that any product in trade can be traced back to its origin (http://www.dinara.gub.uy). Although the system is not meant to verify the legality of the catches, it requires the presentation of the fishing licence of the vessel, the proof of operation of the vessel's VMS and a letter from the vessel's captain declaring the type of fishing and the area of operation. The type of information collected could support the verification of the legality of the products in trade. In addition, as described in the NDF section, the fisheries catching the listed species of sharks in Uruguay have a reasonably good MSC coverage and there would be no apparent difficulty in verifying the legality of catches. It should be also noted that, with the exception of manta rays, prohibitions apply to the other species and it would be illegal to land and trade specimens originating from the main types of fisheries catching sharks.

Institutional collaboration

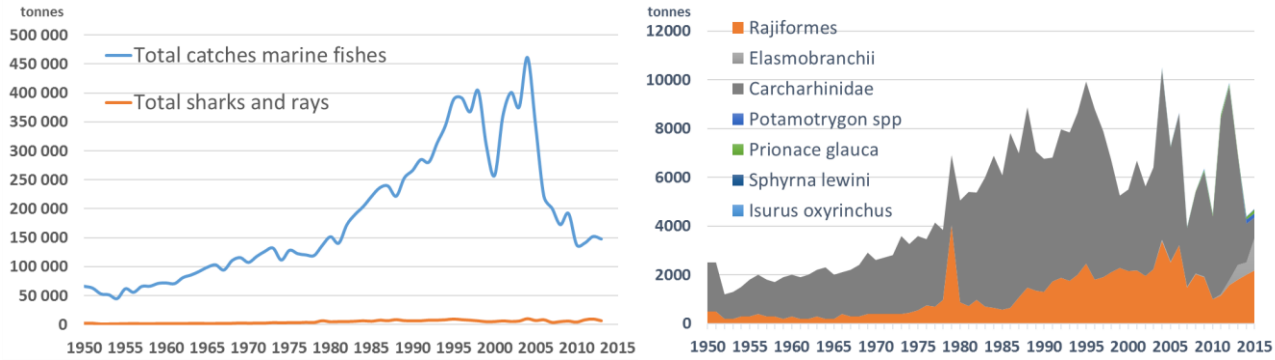
The National Directorate of Aquatic Resources (DINARA) of the Ministry of Livestock, Agriculture and Fisheries is the competent authority for all aspects related to responsible use of aquatic resources and ecosystems, including fisheries and aquaculture. It is also the competent official authority on health and food safety of fishery and aquaculture products. The Directorate General of Renewable Natural Resources (DGRNR) of the Ministry of Livestock, Agriculture and Fisheries is the CITES management and scientific authority. The collaboration between the national fishery agency (DINARA) and the CITES Scientific Authority is in place [Dr. Marcel Calvar (RENARE) pers. comm.] In terms of regional/international collaboration, Uruguay manages its fisheries under agreements with Argentina in the Joint Technical Commission for the Maritime Front (CTMFM) and the International Commission for the Conservation of Atlantic Tunas (ICCAT). Decisions taken by these organizations in recent years have strengthened international collaboration for the monitoring and conservation of sharks, particularly by ICCAT (see Management regime).

The Bolivarian Republic of Venezuela

SUMMARY INFORMATION ON SHARK FISHERIES AND TRADE

About 106 species of sharks and rays are caught by commercial fisheries in the Bolivarian Republic of Venezuela. The main proportion of the shark landed (80-90 percent) are bycatch of the artisanal fisheries operating with longlines and nets in continental and insular areas. The remaining 20 percent are caught by industrial polyvalent (palangre y cordel) fisheries. Among the species caught by the medium longliners operating in high seas in the Venezuelan oceanic islands, the silky shark is one of the more frequently landed (Tavares, 2005). *A. superciliosus*, *A. vulpinus*, *C. longimanus*, *S. lewini*, *S. zygaena*, *M. birostris*, *M. hypostoma* and *M. tarapacana*, are also caught in the Bolivarian Republic of Venezuela. Only the scalloped hammerhead is reported to FAO starting from 2008 with the highest value in 2015 (26 tonnes). A large proportion of the catches reported to FAO consist of highly aggregated categories, such as "Requiem sharks" and "Rays, stingrays, mantas nei" (Figure 36). The total catches of sharks and rays increased steadily from 1950 to the mid-1990s. Since then catches have been oscillating substantially. The highest catches were reported in 2004 (12 567 tonnes). In more recent years the average catches have been around 6 300 tonnes/year. This total represents about 4 percent of the total marine capture fisheries production.

Figure 36. Marine capture fisheries production and the composition of the shark catches of Venezuela (Bolivarian Republic of) (Source: FAO, 2017a).



In the Bolivarian Republic of Venezuela, the shark meat is consumed locally, fresh or salted, and the fins are exported. No information could be obtained on the uses and trade in the listed species of sharks. Table 63 reports the data on trade in shark commodities reported by the Bolivarian Republic of Venezuela to FAO. The export of fins (dried, salted or not) reached the maximum amount in 1999 (40 tonnes, valued 874 000 USD) then decreased to an average of 7 tonnes in recent years, valued at USD 48 000/year. For the same period, the country reported imports of frozen sharks of 90 tonnes/year. The total trade in shark products accounts for a small proportion (3.8 percent) of the total trade in marine fisheries commodities.

Table 63. Average (2008 – 2013) trade flow of shark products from Venezuela (Bolivarian Republic of) (FAO, 2016c).

Commodity (average 2008-2013)	Export		Import	
	Tonnes	USD'000	Tonnes	USD'000
Shark fins, dried, whether or not salted, etc.	**7**	48		
Sharks nei, frozen			90	304
Total sharks commodities	**7**	**48**	**90**	**304**
Total all marine fisheries commodities	**6 283**	**9 023**	**49 936**	**305 678**

ASSESSMENT OF NATIONAL CAPACITY TO IMPLEMENT CITES REQUIREMENTS

Criteria were not scored because of the lack of specific information about the fisheries and uses of the listed species. The country did not reply to the questionnaire.

Non-detriment findings

Management regime

Fisheries management is based on the Fisheries and Aquaculture Law of 2014 (Law Decree Nº 1.408/14). and includes entry controls, technical measures, TACs, quotas and MCS measures. The Bolivarian Republic of Venezuela banned the activities of the industrial trawling in the territorial sea and Exclusive Economic Zone (EEZ) in 2009. The more relevant resolution for sharks was adopted in 2012 by the "Ministerio de Poter Popular para la agricultura y tierras", and establishing the technical standards regulating the capture, exchange, distribution, trade and transport of sharks (June 2012, Gaceta Oficial No 39.947). The finning is prohibited and transport and trade of fins requires a certificate of origin demonstrating the legal acquisition. The other articles regulats the captures in the Archipelagos of Los Roques and the Archipelago of Las Aves. It is prohibited the capture of bigeye thresher and the oceanic whitetip shark, and, for the indutrial fisheries, also the capture of silky shark and all the hammerhead sharks of the family Sphyrnidae. The NPOA-Sharks, adopted in 2013, identifies a number of priority actions including the development of shark species identification guides; the creation of a national information system for the NPOA, the improvement of shark monitoring at ports and on board vessels, and the implementation of a research program on shark fisheries (fleet composition, gear, database), shark biology and stock assessment. There is no updated information on the degree of implementation of these actions. The Bolivarian Republic of Venezuela is a member of IATTC, ICCAT and WECAFC. Table 64 summarizes the management measures in place for sharks fisheries.

Table 64. Management measures of relevance to shark fisheries in Venezuela (Bolivarian Republic of). The effectiveness of these measures in addressing the known sources of mortality is noted.

Management measures	Description	Effectiveness
Species prohibitions	- Prohibited catching, transhipping, distribution and trade of *A. superciliosus* and *C. longimanus* (Art.7, Regulation DM/No. 062-2012, Gaceta Oficial No 39.947); - Prohibited for the indutrial fisheries catching the silky shark and all the hammerhead sharks of the family Sphyrnidae (Art. 8, Regulation DM/No. 062-2012, Gaceta Oficial No 39.947); - prohibition of capture of sharks (excepting excepting rays, eagle rays and chimaeras) in the Archipelagos of Los Roques and the Archipelago of Las Aves (Art. 5 Regulation DM/No. 062-2012, Gaceta Oficial No 39.947). - quota of accidental catch of maximum 5 speciments of sharks only for the resident in the two Archipelagos mentioned in in the Archipelagos of Los Roques and the Archipelago of Las Aves (Art. 6 Regulation DM/No. 062-2012, Gaceta Oficial No 39.947). - prohibit retaining onboard, transshipping, landing, or storing, in part or whole, carcasses of silky sharks (*C. falciformis*) caught by purse-seine vessels in the IATTC Convention Area. Require all longline vessels whose fishing licences do not include sharks as a fishing target but catch sharks incidentally, to limit bycatch of silky sharks to a maximum of 20 percent of the total catch by fishing trip in weight. Require their	**Medium – High.** Measure can provide full protection for bigeye thresher and oceanic whitetip and partial protection of silky shark and hammerheads (small-scale fisheries allowed). The lack of information on the level of post-release mortality cast doubt on the actual effectiveness.

Management measures	Description	Effectiveness
	multi-species fisheries using surface longlines1 to limit the catch of silky sharks of less than 100 cm total length to 20 percent of the total number of silky sharks caught during the trip (IATTC C-16-06, 2016). - Require purse-seine vessels flying their flag to follow safe release requirements for all sharks, except those retained aboard the vessel (IATTC C-16-06, 2016). - Prohibit longline vessels flying their flag and targeting tuna or swordfish in the Convention Area from using "shark lines". The IATTC scientific staff shall develop a workplan, for completing full stock assessments for the silky shark (*C. falciformis*) and hammerhead sharks (i.e., *S. lewini*, *S. zygaena* and *S. mokarran*) (C-16-05, 2016). - Prohibit retaining onboard, transshipping, landing, storing, selling, or offering for sale any part or whole carcass of mobulid rays (which includes manta rays and mobula rays) (IATTC C-15-04, 2015); - Prohibit targeting and retention of oceanic Whitetip sharks by fisheries regulated by IATTC. Individuals caught to be released alive, to the extent practicable (Resolution IATTC C-11-10, 2011). Prohibited catch and trade of thresher sharks of the species bigeye thresher shark, oceanic whitetip sharks, hammerhead sharks (except for *S. tiburo*) and silky shark in tuna fisheries regulated by ICCAT (Recommendations 09-07 2009, 10-07 2010, 10-08 2010, 11-08 2011). Moreover, porbeagle should be promptly release unharmed, to the extent practicable (ICCAT Recommendation 13-10 2013).	
Product form restrictions	Prohibited finning of sharks before landing and request of landing of sharks with fins naturally attached (Art. 3 and 4, Regulation DM/No. 062-2012, Gaceta Oficial No 39.947). Required full utilization of shark catches and prohibited finning by applying a 5 percent fin-to-body weight ratio for sharks on board vessels (IATTC Resolution C-05-03 of 2005; ICCAT Recommendation 04-10). Transport and trade of shark fins requires a certificate of origin demonstrating the legal acquisition (Art. 9 Regulation DM/No. 062-2012, Gaceta Oficial No 39.947).	**Low**. Sharks seem to be fully utilized in Costa Rica, being consumed locally and/or exported. The banning of finning would not create an incentive to release sharks incidentally caught in small-scale fisheries.

Management measures	Description	Effectiveness
Participatory restrictions	Licenses and authorizations required for all types of fisheries.	**Low.** Licenses on their own do not guarantee the control or reduction of fishing mortality. They have a higher effectiveness when combined with other technical measures.

Supporting information

The Fisheries and Aquaculture Law (articles 73 and 74), requires the collection of data on catch and effort of commercial species including more detailed information for large vessels. According to the NPOA Sharks, commercial shark stocks are to be assessed every two years. Also, the NPOA Sharks foresees the monitoring of sharks catches at landing sites and implementation of a ten percent observer coverage on board. The level of implementation of these actions is unknown. As a member of tuna RFMOs (IATTC and ICCAT), the Bolivarian Republic of Venezuela is required report catch and effort data on shark species, including those species discarded or released. The actual level of compliance with these measures is unknown. In reality shark catches are reported in highly aggregated categories. Catches of scalloped hammerhead has been sporadically reported and could not provide any reliable source of information about trends in the species.

Monitoring, Control and Surveillance (MCS) capacity

No information could be obtained on the level of implementation of mechanisms for the monitoring, control and surveillance of shark fisheries.

Legal acquisition findings

Legislation

As discussed above, fisheries management is based on the Fisheries and Aquaculture Law of 2014 (Law Decree Nº 1.408/14) and includes entry controls, technical measures, TACs, quotas and MCS measures.The more relevant resolution for sharks was adopted in 2012 by the "Ministerio de Poter Popular para la agricultura y tierras", and establishing the technical standards regulating the capture, exchange, distribution, trade and transport of sharks (June 2012, Gaceta Oficial No 39.947). The articles 3 and 4 regard the prohibition of finning and the landing of sharks with fins naturally attached. The articles 5 and 6 prohibit the capture of sharks (excepting excepting rays, eagle rays and chimaeras) in the Archipelagos of Los Roques and the Archipelago of Las Aves. Art. 6 establisha a quota of accidental catch of 5 speciments of sharks only for the resident in the two Archipelagos mentioned in article before. Article 7. Prohibition of catching, transhipping, distribution and trade of the bigeye thresher and the oceanic whitetip shark. Art. 8 prohibition for the indutrial fisheries of catching the silky shark and all the hammerhead sharks of the family Sphyrnidae. Moreover, the transport and trade of shark fins requires a certificate of origin demonstrating the legal acquisition. As a member of IAATC and ICCAT, the Bolivarian Republic of Venezuela has to comply with shark conservation measures adopted for the fisheries managed by these organizations (summarized in Table 64).

Species identification

No information could be obtained on the current capacity to identify species in the catches and in the products in trade. According to Fischer *et al* (2012), in spite of the fact that shark catches are reported to FAO at high levels of aggregation, the NPOA-Sharks includes detailed descriptions of shark landings by species indicating a greater capacity for species identification in the country. The NPOA also observes that while the industrial trawl fishery reports shark catches at highly aggregated levels, observers on board of pelagic longline fishing vessels inform much better about the species composition of catches. The development of shark identification tools is included in the NPOA Sharks. FAO species identification guides and other tools are available for the Western Central Atlantic (Annex4).

Traceability

No information could be obtained on existing traceability mechanisms (and the overall MCS capacity) that could assist in the verification of the origin and legality of shark and ray products along the supply chain. the Bolivarian Republic of Venezuela is a member of the IATTC, which implies adherence to the adopted management measures including the requirement to establish a bigeye tuna statistical document program (IATTC Resolution C-03-01) where all imports and re-exports of bigeye are to be accompanied by a Statistical Document. As a party to ICCAT, the Bolivarian Republic of Venezuela has also to comply with the catch documentation schemes adopted by the organization for the tunas and swordfish. Although these measures are directed to tunas and swordfish, their implementation would facilitate the application of similar schemes for sharks caught in association with tuna fisheries. The Regulation DM/No. 062-2012 requires that the transport and trade of shark fins need to be accompany by a certificate of origin demonstrating the legal acquisition. The level of implementation of these measures is not known.

Institutional collaboration

The Socialist Institute of Fisheries and Aquaculture (INSOPESCA) is responsible for fisheries management. The Ministry of Environment (Ministerio del Poder Popular para el Ambiente) is the CITES Management Authority and plays also the role of Scientific Authority through different divisions and institutes. The level of collaboration between the fisheries and CITES authorities is unknown.

As a member of IATTC and ICCAT, the Bolivarian Republic of Venezuela is required to participate in the initiatives implemented by these organizations for the conservation and monitoring of sharks caught in association to tuna fisheries.

ANNEX 3. Availability of biological and fishery data in the countries covered by the regional assessments.

PARAMETERS	The Democratic Republic of the Congo	Ghana	Guinea	Mauritania	Namibia	Nigeria	Senegal
Size/age composition	–	–	*S. lewini*	–	–	–	*S. lewini*
Growth	–	–	–	–	–	–	–
Maturity	–	–	*S. lewini*	–	–	–	*S. lewini*
Fecundity	–	–	*S. lewini*	–	–	–	*S. lewini*
Reproductive cycle	–	–	*S. lewini*	–	–	–	*S. lewini (*some local knowledge about other species).
Nursery areas	–	–	*S. lewini*	–	–	–	–
Other critical/essential habitats (e.g. aggregation sites for mating, feeding, cleaning)	–	–	*S. lewini*	–	–	–	– (some data on fishing areas collected in the PAN Sharks)
Mortality (natural, from fisheries (including post-release mortality), and from other anthropogenic factors)	–	–	–	–	–	–	–
Temporal and spatial distribution	–	Catches off the Western shelf (between Apam and Axim) from	–	–	–	–	–

		October to March					
Abundance trends	–	From landing and effort data (elasmobranchs: 1996 – 2012; rays: 2004-2012)	From aggregated landings (1999 – 2010) and effort (2005 – 2010) data	From hammerheads and *S. lewini* landings data after 2009.	– (landings data not by species)	– (landings data not by species)	Based on landings data, from 1990 - 2012 (not specific)
Additional sources			Beavogui *et al*., 2011				Mar *et al*., 2011

PARAMETERS	China	India	Indonesia	Iran	Republic of Korea	Malaysia	Pakistan	Sri Lanka	Taiwan Province of China	Thailand	Yemen	United Arab Emirates
Size/age composition	*S. lewini*	—	Sizes (*S. lewini* and mobulids)	—	*Size data by species, 2010-2013, Indian Ocean*	Hammer heads and manta rays	—	Hammer heads and whitetip	?	S. lewini	S. lewini	?
Growth	*S. lewini*	—	—	—	—		—	—	?	—	—	?
Maturity	*S. lewini*	—	*S. lewini* and mobulids	—	—	Hammer heads and manta rays	—	—	?	—	—	?

Fecundity	—	—	*S. lewini*	—	—	Hammer heads	—	—	?	—	—	?
Reproductive cycle	*S. lewini*	—	*S. lewini*	—	—		—	—	?	—	—	?
Nursery areas	—	—	—	—	—	Rays and hammerheads	*S. lewini*	—	?	—	—	?
Other critical/essential habitats (e.g. aggregation sites for mating, feeding, cleaning)	—	—	—	—	—	Hammer heads	—	—	?	—	—	?
Mortality (natural, from fisheries (including post-release mortality), and from other anthropogenic factors)	*S. lewini*	—	*S. lewini*	—	—	—	—	—	?	—	—	?
Temporal and spatial distribution	*S. lewini*	From exploratory surveys and catch monitoring.	—	Overall distribution pattern for all sharks (surveys)	Porbeagle shark, 2010-2013, Indian Ocean	—	—	—	?	—	—	?

Abundance trends	—	From exploratory surveys and catch monitoring	*M. birostris*. Landings S. lewini (2002-2012); whitetip (2002 – 2011); Manta (2006 – 2011). Oceanic whitetip (CPUE oceanic areas of Indian ocean)	Overall trend for all sharks (annual trawl surveys since 2002). Catch, effort and discards of fish and shrimp trawlers (since 1996)	—	—	—	Trend in catches and (possibly) CPUE of hammerheads and oceanic whitetip in offshore fisheries.	?	—	—	?
Additional sources	Oceanic whitetip (Pacific): Seki *et al*. (1998); Rice and Harley (2012)	—	Dharmadi & Fahmi (2000); Blaber *et al*., (2009); Fahmi & Sumadhiharga (2007); White *et al*. (2008); White *et al*. (2006); FAO (2013)	—	—	Yano *et al* (2005), SEAFDEC (2006), Ahmad and Annie (2012), Ahmad *et al*. (2014/ in press), Ahmad *et al*. (2013).	—	—		—	—	

PARAMETERS	Argentina	Brazil	Costa Rica	Ecuador	Mexico	Peru	Uruguay	Venezuela (Bolivarian Republic of)
Size/age composition	*L. nasus* (bycatch 2003 – present)	*S. lewini, S. zygaena*	–	*S. lewini, S. zygaena (2003 – 2010)*	?	–	*S. lewini, S. zygaena, C. longimanus, L. nasus*	
Growth		*S. lewini*	–		?	–		
Maturity		*S. lewini, S. zygaena*	–	*S. lewini, S. zygaena (2003 – 2010)*	?	–	*L. nasus*	
Fecundity		*S. lewini, S. zygaena*	–		?	–	*S. lewini, S. zygaena, L. nasus*	
Reproductive cycle		*S. lewini, S. zygaena*	–		?	–		
Nursery areas		*S. lewini, S. zygaena*	–		?	–		
Other critical/essential habitats (e.g. aggregation sites for mating,		*S. lewini, S. zygaena*	–	*S. lewini, S. zygaena (2008 – 2010)*	?	–		

feeding, cleaning)								
Mortality (natural, from fisheries (including post- release mortality), and from other anthropogenic factors)	*L. nasus*	*S. lewini*	–		?	–		
Temporal and spatial distribution	*L. nasus* (bycatch 2003 – present)	*S. lewini*, *S. zygaena*	–		?	–	All species	
Abundance trends	*L. nasus*: CPUE Uruguayan fleet (1982 – present) Bycatch (2003 – present)	*S. lewini*, *S. zygaena*	*C. longimanus*, CPUE data IATTC. Hammerheads, dive sightings.	*S. lewini*, *S. zygaena (2003 – 2010)*	Hammerhead landings	Catch data *S. lewini* and *Manta* spp.	All species	
Additional sources	SCRS, 2009; Waessle and Cortes, 2011; Waessle, 2007	Vooren & Klippel, 2005; Kotas, 2004; Kotas *et al*., 2011	Roman-Verdesoto, M. and M. Orozco-Zoller 2005; IATTC, 2007: Myers *et al*., 2005				ICCAT, 2010	

ANNEX 4. Current uses of common MCS tools in shark fisheries in the countries covered in the regional assessments.

Country	Logbook	Observers on board (% fleet)	Vessel Monitoring Systems (% fleet)	Fishery covered by dockside monitoring programs	Fishery regularly covered by sea and port inspections	Catch certification scheme
The Democratic Republic of the Congo	–	–	–	–	–	–
Ghana	–	–	VMS in industrial fleet Some canoes monitored with GPS	Catch and effort monitoring (partial)	Occasionally	–
Guinea	Industrial	Industrial	–	Industrial (yes), small-scale (partial)	Industrial (yes), small-scale (partial)	Yes
Mauritania	Industrial (yes)	Industrial (yes)	Industrial (yes)	Industrial (yes), small-scale (partial)	Industrial (yes), small-scale (partial)	Yes
Namibia	Yes	100%	20%	Yes	Yes	Yes
Nigeria	Yes	Not on shrimp trawlers.	Not for shrimp trawlers. Inoperative in other fleets.	Yes	Port inspection. Occasional sea patrol	Yes
Senegal	Industrial (yes)	Yes (industrial foreign fleet)	Requirement for all industrial vessels, in order to obtain licence.	Industrial (yes) Small-scale (partially)	Industrial (yes) Small-scale (occasionally)	Yes (industrial and small-scale)

Country	Logbook	Observers on board (% fleet)	Vessel Monitoring Systems (% fleet)	Fishery covered by dockside monitoring programs	Fishery regularly covered by sea and port inspections	Catch certification scheme
China	Not on domestic vessels.	Not on domestic vessels.	Only in some high-powered (industrial) domestic vessels.	Some large and medium-sized fishing ports are covered. Small-sized ports not covered.	Yes. Frequency dependent on funds.	No
India	Only in few large size vessels	No	Only in few large size vessels	Partially (8- 10% of coastal landings are sampled).	No	No
Indonesia	Industrial tuna fishery	Industrial tuna fishery: 23 observers (2013) 14 observers (2014)	Lack of control and coordination between fisheries management and fishing operators.	No	No	No
Iran	Yes	2%	Vessels with length overall> 24m = 100%	No	10%	Yes?
Republic of Korea	Yes (distant water fleet, dwf)	Yes (dwf)	100% (dwf)	Yes (dwf)	Yes (sea inspenction in the WCPFC and port inspections)	Yes
Malaysia	Yes	No	Vessels with more than 40 GRT (Zone C and above)	Few landing sites covered (13 out of 2000)	No	No
Pakistan	No	Negligible	No	Yes	Partially	Yes?
Singapore	—	—	—	—	—	—
Sri Lanka	Offshore fisheries	No (proposed)	No (proposed)	Yes	Yes	No (tunas only)
Thailand	Yes	No	No	Partially	Partially	Yes
United Arab Emirates	?	?	?	?	?	?
Yemen	Industrial trawlers	No	No	Yes	No	No

Country	Logbook	Observers on board (% fleet)	Vessel Monitoring Systems (% fleet)	Fishery covered by dockside monitoring programs	Fishery regularly covered by sea and port inspections	Catch certification scheme
Argentina	Yes	90 % - 100%	100%	Yes	Yes	Exports to the EU. Patagonian grenadier (MSC)
Brazil	Yes	Pilot projects with gillnet and trawling fleets.	> 90% of gillnet and trawling fleet with (vessels > 15 m). Pelagic longline fishery not covered.	Yes	Port inspections	No
Costa Rica	Required by Law to all fisheries	–	Required by Law for tuna purse seiners	–	Port inspections for medium-scale and industrial vessels.	–
Ecuador	Yes	10% of the longline fleet	Yes	Yes	Yes	Yes
Mexico	Required by Law to all fisheries	Required by Law	Required by Law for medium and large scale vessels (> 10 m or 10 tonnes GRT)	?	?	?
Panama						
Peru	?	No	No	Project since 2000 monitors artisanal landings.	?	?
Uruguay	Yes	5 – 100%	100%	Yes	Yes	Yes
Venezuela (Bolivarian Republic of)						

ANNEX 5. EXAMPLES OF AVAILABLE FIELD GUIDES AND OTHER IDENTIFICATION TOOLS FOR ELASMOBRANCH SPECIES.

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