

**Sarah Fowler, Amie Bräutigam, Nicola Okes
and Glenn Sant**

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CITES-Listed Sharks**



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Cover picture: Silky Shark *Carcharhinus falciformis* (Jeremy Stafford-Deitsch)

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Preface

The impact of fisheries supplying international trade has increased concerns about the conservation of these species of sharks and rays for over two decades. Meanwhile, 14 species of pelagic sharks and 27 rays are listed in the Convention of International Trade in Endangered Species of Wild Fauna and Flora (CITES) Appendix II. Many of them are still recorded in fisheries and trade, including species prohibited in the pelagic fisheries and regulated by tuna Regional Fisheries Management Organizations (tRFMOs). The Federal Agency for Nature Conservation of Germany (BfN) has supported many of the CITES shark listings and has contributed to their implementation by capacity building measures and relevant workshops, such as the development of guidelines for making non-detriment findings (NDFs) for sharks.

FAO Members and CITES Parties regularly urge closer engagement and coordination between bodies of environment and fisheries, in order to improve the status of sharks, while recognising shared common objectives for the recovery of depleted stocks, and achieving sustainable fisheries and trade. The BfN has commissioned the present report, summarising the conservation, trade, and management status of sharks and rays, and outlining the activities of Regional Fisheries Bodies (RFBs – advisory and management) for the conservation and management of pelagic species. The report addresses both conservationists and fisheries authorities informing about the conservation status as well as existing conservation measures for all CITES listed shark and ray species.

The conservation status of many CITES Appendix II-listed sharks is still deteriorating, including species that are major sources of shark fins in international trade, while the listed shark-like rays from shallow coastal habitats are among the world's most threatened cartilaginous fishes. There are slight signs of recovery for only a few shark species, listed nearly 20 years ago. The report shows that fishing affects every CITES-listed shark species. It however also addresses the potential for sustainable use and trade under conservation measures by CITES and relevant Regional fishery bodies (RFBs) on a species-specific basis.

Prof. Dr. Beate Jessel

President of the Federal Agency for Nature Conservation

1 Introduction

This status report was commissioned by the German Federal Agency of Nature Conservation on behalf of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. It reviews the threats to shark¹ species, their conservation, trade and management status, and the contributions of Regional Fishery Bodies (RFBs) to the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) for sharks listed in the CITES Appendices. This stock-taking exercise provides a basis for analyzing the potential to further harmonize the efforts of CITES and RFBs (including the Regional Fisheries Management Organizations – RFMOs) in delivering their common objectives for the protection and sustainable management of sharks, including recovery of depleted stocks, legal and sustainable fisheries and trade.

Related project activities, not reported here, include a survey of the views of environment and fisheries experts and practitioners from CITES Parties, RFBs and other non-governmental sectors on options for improving collaboration between their respective agencies.

Webinars convened by BfN and BMU will discuss project findings and consider practical opportunities to advance joint work and tap into synergies between the shark conservation and management programmes and mandates of government wildlife and fisheries agencies, RFBs and CITES.

The aim is to identify cooperative strategies that can deliver more effectively the conservation and management of sharks, including their legal and sustainable use when appropriate, and to reduce the future need for strict protection measures. Depending upon the outcomes of the above activities, the BMU is considering convening a high-level conference of policy-makers to discuss steps towards implementation.

¹ The term “sharks” is used here to refer to all species of sharks, skates, rays and chimaeras (the cartilaginous fishes, Class Chondrichthyes). Elasmobranch fishes include the sharks, skates and rays; batoid fishes are the skates and rays.

2 Background

Fourteen species of pelagic sharks, 11 pelagic rays and 16 coastal rays have been listed in CITES Appendix II since 2002 (Table 1). Many of these species were historically targeted by fisheries, all are or have been a secondary catch or bycatch, and some of those listed by CITES in 2013, 2016 and 2019 are still fished and traded in significant volumes. (The Appendix I-listed sawfishes, Pristidae, which may not be traded commercially, and Appendix III-listed freshwater stingrays, Potamotrygonidae, are not considered in this document.)

FAO Members and CITES Parties² have for many years, at their respective meetings, urged closer engagement and coordination between national environment and fisheries departments in order to improve the conservation and management of sharks. The important role of Regional Fishery Bodies (RFBs), including both the advisory RFBs and the Regional Fisheries Management Organizations (RFMOs), has also been recognised, most recently in the updated Resolution Conf.12.6 (Rev. CoP18) (Annex 7). Indeed, several tuna Regional Fishery Management Organisations (tRFMOs) had already prohibited the retention of some threatened pelagic shark species before they were listed in Appendix II of CITES.

Since the listing of several shark species in CITES Appendix II at CoP16 in 2013, an unprecedented number of projects and activities have been delivered to assist Parties with the implementation of these listings. These capacity-building activities have been undertaken with funding from the European Union, the support of many other Parties and stakeholders, and in close collaboration between the CITES and FAO Secretariats.

The CITES and FAO Secretariats cooperate under a joint MOU (2006) and a subsequent agreement for activities to support Parties in the implementation of marine species listings. They convened regional workshops in West Africa, Asia and Africa during 2014 to review CITES implementation issues and formulate recommendations and priorities for improving the capacities of CITES Management Authorities and their fisheries counterparts to fulfil their CITES obligations for these species. While outcomes varied, there was much congruence between the issues identified and recommendations formulated; many were incorporated in the Decisions adopted by CITES CoP17 and the design of a second phase of EU-funded capacity building (2017–2020). They identified the need for strengthened regional and international collaborations; stronger conservation and management measures; improved national legislation and enforcement (monitoring, control and surveillance); and better data collection, harmonisation and exchange mechanisms (Anonymous 2014 a, b, c). A further workshop was held in March 2017, attended by staff from the Secretariats of CITES, FAO and several RFBs, to discuss lessons learned during the implementation of these activities, future opportunities for cooperation, and priorities for capacity-building. In many cases, implementing these recommendations necessitates the adoption of long-term initiatives; progress towards these goals requires several small steps. While some good headway has been made, many of these steps may require political and/or financial support, and further capacity-building.

Despite these efforts, however, there has not been a global evaluation of individual RFB activities directed at improving the conservation and management status of the shark species listed in Appendix II (or for unlisted species). Neither has there been an assessment of the overall contribution of the CITES listings to improving the conservation and management of

² Disclaimer: The designations of geographical entities in this document, and the presentation of the material, do not imply the expression of any opinion whatsoever on the part of the authors concerning the legal status of any country, territory, or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

pelagic shark species. This report lists relevant RFMO Conservation and Management Measures (CMMs), as a first step towards the former, but has not identified sufficient data to evaluate the latter, particularly for shark species listed within the past decade.

3 The conservation status of major commercial shark species

3.1 IUCN Red List assessments

A decade ago, the IUCN Shark Specialist Group completed the first global Red List assessment of the relative risk of extinction faced by all chondrichthyans (sharks, rays and chimaeras). One-quarter of all species were found to be threatened³ due to overfishing (targeted and incidental). Large-bodied, shallow-water species were at greatest risk, with over 50% of coastal, continental shelf, and pelagic species over 100cm long threatened. The analysis concluded that improved management of fisheries and trade is urgently needed to avoid extinctions and promote population recovery (Dulvy et al. 2014).

Ten years later, a global reassessment programme is almost complete, with fewer than 20% of IUCN Red List assessments not yet updated in January 2021. About 27% of chondrichthyans assessed are threatened (Figure 1, source www.iucnredlist.org). Interim results confirm that large-bodied, shallow-water species still face the greatest threats, and that an even higher proportion of large-bodied coastal, continental shelf and pelagic species than was recognised in the 2000s have a heightened risk of extinction. A few Red List changes are ‘non-genuine’, due to more data on historical risks and population status having become available, but most up-listings into a more threatened Red List category reflect a genuine deterioration in status. Such deterioration is particularly pronounced in the oceanic pelagic sharks and rays listed in CITES Appendix II, most of which are a bycatch or target of fisheries managed by the tuna Regional Fisheries Management Organizations (tRFMOs), and Appendix II large coastal rays.

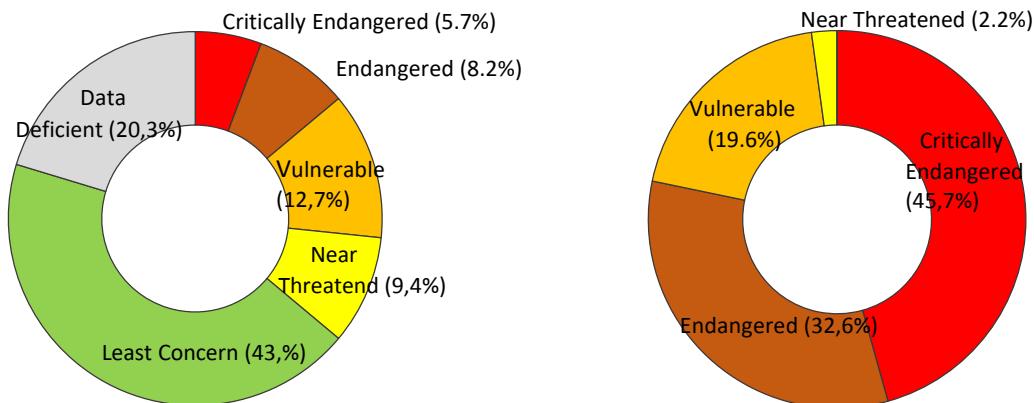
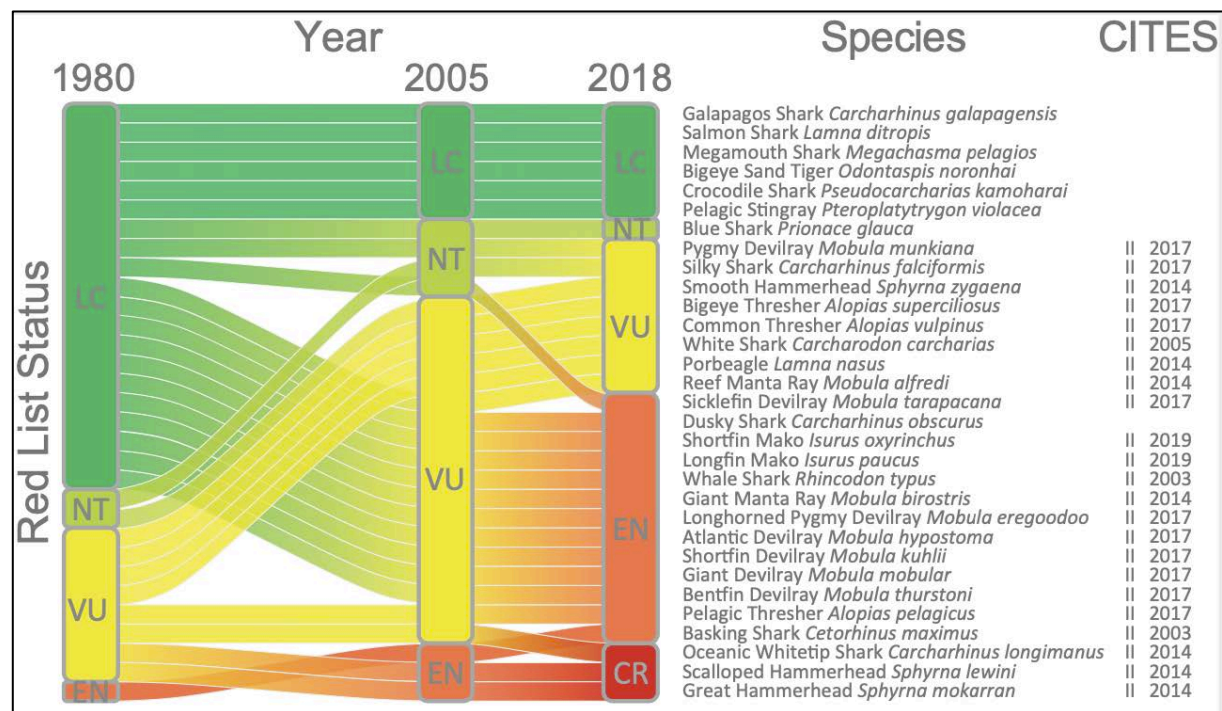


Figure 1. IUCN Red List assessments for all 1,186 chondrichthyan species (left), and 46 species listed in CITES Appendix II (right). Source: www.iucnredlist.org January 2021.

³ Threatened: Critically Endangered (CR), Endangered (EN) and Vulnerable (VU), based on population size reductions over three generations (often 50–100 years for large slow-growing sharks and rays) from the IUCN Red List Categories and Criteria.

When first analysed, 50% of oceanic pelagic species were found to be threatened (Dulvy et al. 2008; Camhi et al. 2009). The status of 27 sharks and four rays has now been reassessed, and Red List assessments back-cast to 1970 to examine the 50-year population trends of 18 data-rich species (Pacoureau et al. 2021). The new analyses concluded that the global abundance of oceanic sharks and rays had declined by 71% from 1970 to 2018, at a steady rate averaging 18.2% per decade. In 1980, two-thirds of oceanic shark species were Least Concern and nine species were threatened. Now, over three-quarters are threatened. This decline is attributed to an 18-fold increase in relative fishing pressure while catch rates tripled. It does not take into account declines driven by fisheries before 1970, or under-estimates of unreported catches and discard mortality.

Figure 2 presents trends in extinction risk since 1980 for the 31 species of oceanic sharks and rays developed by Pacoureau et al. (2021). Twenty-two of the 23 threatened oceanic species are listed in CITES Appendix II. The patterns of declines differ between oceans and relative shark body size classes. Pelagic sharks in the Atlantic were the first to be heavily exploited, from the early 1900s. Their abundances continued to decline steadily from 1970 and began to stabilize at low levels after 2000. North Pacific Ocean pelagic sharks were also fished in the early 1900s. Their abundances fell steeply from 1970 to 1990, then decreased at a slower rate thereafter. In the Indian Ocean, there has been a steep decline since 1970 of about 85% (range 76–92%). Abundance of the largest-bodied species fell most steeply before the 1980s, medium-sized species declined next, and finally the relatively small-bodied species. Tropical sharks also declined more steeply than temperate species (despite the more resilient life histories of the former).



CR, Critically Endangered; EN, Endangered; VU, Vulnerable; NT, Near Threatened; LC, Least Concern.

Figure 2. Change in the Red List status of oceanic sharks and rays, 1980–2018, and dates Appendix II listings entered into force. Adapted from Fig. 3b in Pacoureau et al. 2021.

The basking shark *Cetorhinus maximus* (assessed as Vulnerable when listed in CITES Appendix II in 2002) is an example of a non-genuine change in status. New analyses indicate that populations experienced greater declines over the past 100 years (the three-generation

period) than originally believed; it should have been classified as Endangered when originally assessed. Recent reports of some depleted stocks stabilising, and a possible recovery in the Northeast Atlantic following cessation of target fishing, are too recent to influence the overall global assessment for this very long-lived species. However, a combination of 15 years of international trade regulation discouraging unsustainable fisheries, protected status in many EEZs and some zero quotas will be aiding recovery. Although the great white shark *Carcharodon carcharias* and porbeagle *Lamna nasus* are still assessed as Vulnerable, some stocks of these species are also showing signs of recovery. However, stocks of the world's most heavily protected oceanic whitetip shark, *Carcharhinus longimanus*, which had been prohibited in all tRFMO fisheries before Appendix II came into effect in 2014, have nonetheless continued to decline. It is unclear to what extent this is affected by lower catch reports following adoption of the non-retention measures.

Among the coastal and shelf species at highest risk of extinction, two species of sawfishes (family Pristidae) are Endangered and three Critically Endangered; all five species are listed in CITES Appendix I. The giant guitarfishes (six species in family Glaucostegidae, all Critically Endangered) and wedgefishes (nine out of ten species in family Rhinidae are Critically Endangered) face an even higher risk of extinction (Kyne et al. 2020); in 2019, these two families were listed in CITES Appendix II. These coastal and shelf species are not captured in the pelagic fisheries managed by the tRFMOs. Of the other RFMOs, only the General Fisheries Commission for the Mediterranean (GFCM) has adopted management measures for some of these taxa.

Table 1. Conservation status of sharks and rays listed in the Appendices to CITES and the Convention on Migratory Species (CMS).

Common name	Species	Habitat	CITES	Effective	Red List	Year	CMS	Year
Pelagic thresher shark	<i>Alopias pelagicus</i>	pelagic	II	2017	EN	2019	II	2014
Bigeye thresher shark	<i>Alopias superciliosus</i>	pelagic	II	2017	VU	2019	II	2014
Common thresher	<i>Alopias vulpinus</i>	pelagic	II	2017	VU	2019	II	2014
Silky shark	<i>Carcharhinus falciformis</i>	pelagic	II	2017	VU	2017	II	2014
Oceanic whitetip shark	<i>Carcharhinus longimanus</i>	pelagic	II	2014	CR	2019	I	2020
Basking shark	<i>Cetorhinus maximus</i>	pelagic	II	2003	EN	2019	I, II	2005
White shark	<i>Carcharodon carcharias</i>	pelagic	II	2005	VU	2019	II	2002
Shortfin mako shark	<i>Isurus oxyrinchus</i>	pelagic	II	2019	EN	2019	II	2008
Longfin mako shark	<i>Isurus paucus</i>	pelagic	II	2019	EN	2019	II	2008
Porbeagle shark	<i>Lamna nasus</i>	pelagic	II	2014	VU	2019	II	2008
Whale shark	<i>Rhincodon typus</i>	pelagic	II	2003	EN	2016	I, II	1999-2018
Scalloped Hammerhead	<i>Sphyrna lewini</i>	pelagic/ coastal	II	2014	CR	2019	II	2014
Great hammerhead	<i>Sphyrna mokarran</i>	pelagic/ coastal	II	2014	CR	2019	II	2014
Smooth hammerhead	<i>Sphyrna zygaena</i>	pelagic/ coastal	II	2014	VU	2019	I	2020
Manta rays	<i>Mobula (Manta), 2 spp.</i>	pelagic/ coastal	II	2014	VU, EN	2018 & 2020	I, II	2014
Mobulid/devil rays	<i>Mobula, 9 spp.</i>	pelagic/ coastal	II	2017	2 VU, 7 EN	2019 & 2020	I, II	2014
Sawfishes	Pristidae, 5 sp.	coastal	I	2007	2 EN, 3 CR	2013	I, II	2014
Giant guitarfishes	Glaucostegidae, 6 spp.	coastal	II	2019	All CR	2019		
Wedgefishes	Rhinidae, 10 spp.	coastal	II	2019	9 CR, 1 NT	2019	II**	2017

Key to IUCN Red List assessments. CR: Critically Endangered; EN: Endangered; VU: Vulnerable; NT: Near Threatened. Most species listed in the CMS Appendices are included in the Annex to the CMS Migratory Sharks Memorandum of Understanding. ** One Wedgefish species (*Rhynchobatus australiae*) is listed in Appendix II of CMS.

3.2 Other sources of information on status

Stock status is also evaluated regularly by national fisheries departments or Regional Fishery Bodies (RFBs) for the relatively small number of species that are important in fisheries or are a significant bycatch (incidental catch). These assessments take the form of quantitative fisheries stock assessments, or Environmental Risk Assessments (ERAs), which often integrate biological vulnerability and exposure to fisheries to provide a relative ranking of risk to each species. Where adequate data are available, stock assessments can provide estimates of original (virgin) and current population size (sometimes including estimates of the number of mature females present), and future trajectories under different fishing scenarios (see example in Figure 3). They form the basis for the scientific advice prepared by RFBs for their members and are discussed when considering management options, which may range from quotas to gear restrictions and complete prohibitions. However, as Figure 3 demonstrates, many stock assessments are highly uncertain, particularly in the early years when data availability is poor. This makes it important for regular reviews to take place.

When available, shark and ray stock assessments and ERAs are integrated into the IUCN Red List assessment process. Indeed, Pacoureau et al. (2021) used 57 time-series datasets for 18 species, including stock assessments, in their analysis. However, limited resources for Red Listing and over 1,000 species requiring assessment every decade means that fisheries assessments are reviewed more regularly than Red List Assessments for the same species. Furthermore, Red List assessments are primarily global in nature, with regional assessments often given a lower priority; it is not possible to update them annually or biennially. The added value of the Red List assessment process is derived from its global coverage of the entire taxonomic group, and the ability to develop Red List indices that can be used to illustrate changes in status over time.

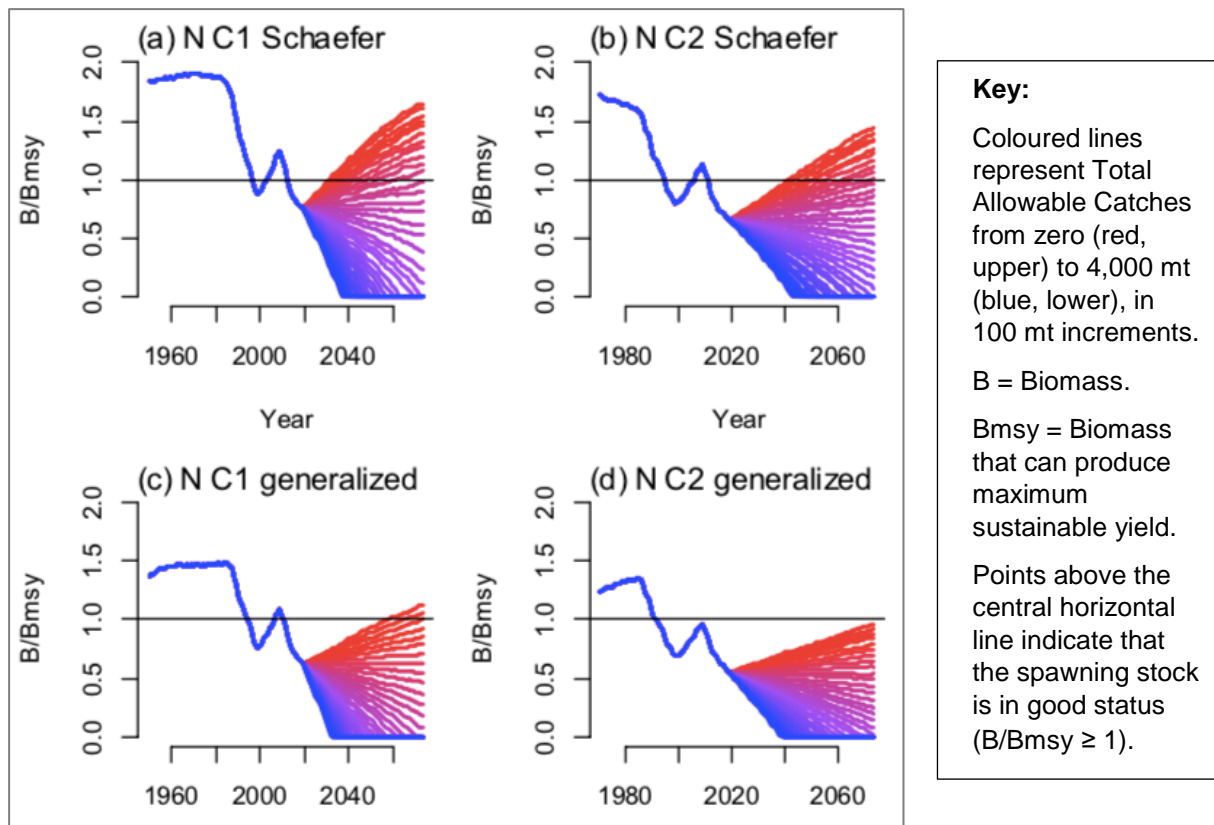


Figure 3. Past spawning biomass trend and future projections for North Atlantic Shortfin mako shark (*Isurus oxyrinchus*) from four modelled scenarios. (From ICCAT SCRS 2019.)

4 Threats to chondrichthyan fishes (sharks, rays and chimaeras)

The IUCN Red List website lists the known threats to every chondrichthyan species assessed (1,186 in January 2021). These data are summarised in the following pages. Table 2 shows the numbers and percentages of species affected by each major category of threat for marine (1,168) and freshwater species (26 obligate freshwater species and 14 species that can move from the sea, through estuaries, into rivers and lakes). Overall, fishing poses the most widespread and serious threat to the chondrichthyans, affecting 1,063 species (89.6%), while only 148 species are recorded also to be affected by one or more other forms of threat. Inshore and freshwater species are at greatest risk from multiple threats. Regarding the 316 CR, EN or VU species: all are threatened by fishing, but an additional 133 pressures are reported for these taxa, with (*inter alia*) 55 threatened species also affected by urban, commercial or tourism developments, 22 by pollution, and 19 by aquaculture. Conversely,

148 species are not recorded as being affected by any fishing activity, but experience other impacts. Only for 86 of the 517 Least Concern species have no threats been recorded so far.

Table 2. Threats to the chondrichthyan fishes. (From www.iucnredlist.org, January 2021)

Broad categories of threat	Marine species (N=1,068)		Species in freshwater (N=40)		All species (N=1,186)	
	N	%	N	%	N	%
Biological resource use	1,045	90.2%	34	85.0%	1,066	89.9%
Fishing & harvesting aquatic resources					1,063	89.6%
Logging & wood harvesting					8	0.7%
Residential & commercial development	70	6.0%	19	47.5%	82	6.9%
Pollution	34	2.9%	16	40.0%	43	3.6%
Natural system modifications (dams)	18	1.6%	16	40.0%	29	2.4%
Climate change (mainly habitat alteration)	24	2.1%	4	10.0%	25	2.1%
Aquaculture (primarily) & agriculture	20	1.7%	3	7.5%	23	1.9%
Mining; oil and gas extraction	19	1.6%	5	12.5%	22	1.9%
Human disturbance (recreational activities)	17	1.5%	0	0.0%	17	1.4%
Transport & service corridors	3	0.3%	1	2.5%	3	0.3%
Invasive & other problem species, disease	3	0.3%	0	0.0%	3	0.3%
No threats reported	86	7.4%	0	0.0%	86	7.3%

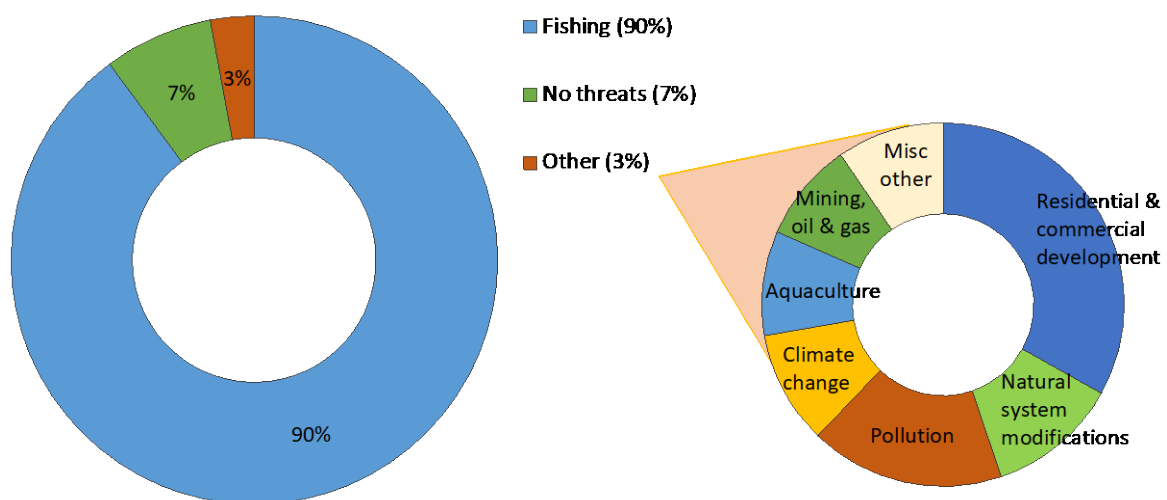


Figure 4. Major threats to chondrichthyan fishes. (www.iucnredlist.org, January 2021)

The IUCN Red List further divides fishing into the sub-categories listed in Table 3. Many species, particularly in coastal areas, are affected by several types of fishery – for example, a single species may be a target of some fisheries but bycaught in others, and also captured in both large and small-scale fisheries. This is why totals in the right-hand column exceed 100%.

Table 3. Threats to all chondrichthyan fishes from different scales of fishery
(Source: www.iucnredlist.org, January 2021)

Threat	Number of all species affected	Percentage of 1,186 species affected
Unintentional effects:	1045	88%
Industrial/large-scale fisheries bycatch	985	83%
Bycatch, subsistence/ small scale fisheries	621	52%
Intentional use:	314	26%
Target subsistence/small scale fisheries	262	22%
Target Industrial/large-scale fisheries	192	16%
Persecution/ control	21	2%
Not threatened by fishing	87	7%

All of the 21 species that are the subject of “persecution or control” are also taken, generally in much larger numbers, in target and/or bycatch fisheries. They include species caught in the beach protection programmes that target large predatory sharks, including great white shark, or which are killed because they damage fishing gears (e.g. sawfishes and basking sharks), or are a nuisance if they deplete fishers’ catches.

Table 4 focuses solely upon the threats to the pelagic sharks and rays listed in CITES Appendix II. All are threatened by excessive fisheries mortality, but a much larger percentage of Appendix II species than of all species combined is taken in target fisheries (including as a valuable secondary retained catch of fisheries that primarily target other species). However, species are listed in Appendix II precisely because they have been seriously depleted by the fisheries that are the source of the valuable products that enter international trade.

Table 4. Threats to Appendix II pelagic sharks & rays from different scales of fishery.
(Source: www.iucnredlist.org, January 2021)

Threat	Number of Appendix II species affected	Percentage of species affected
Unintentional effects:		
Industrial/large-scale fisheries bycatch	25	100%
Subsistence/small scale fisheries bycatch	25	100%
Intentional use:		
Target subsistence/small scale fisheries	24	96%
Target Industrial/large-scale fisheries	23	92%
Persecution/control	1	4%

Figure 5 illustrates the data in Tables 3 and 4. Over 90% of CITES-listed shark and ray species are recorded in the Red List as being targeted by at least some fisheries, versus only 22% of all chondrichthyans, whereas 100% of CITES Appendix II species and over 50% of all species are taken unintentionally, as bycatch. Small scale and subsistence fisheries target and retain bycatch of a significantly larger number of all species than do large-scale/industrial fisheries, although the difference for those listed in CITES Appendix II is small. Many sharks and rays bycaught in industrial fisheries may be discarded, and some of these could survive. Subsistence/small-scale fisheries, which operate in more biodiverse coastal areas, not only target a slightly larger number of species than industrial fisheries, but also retain a larger proportion of their bycatch (in such cases, bycatch is actually a secondary non-target catch).

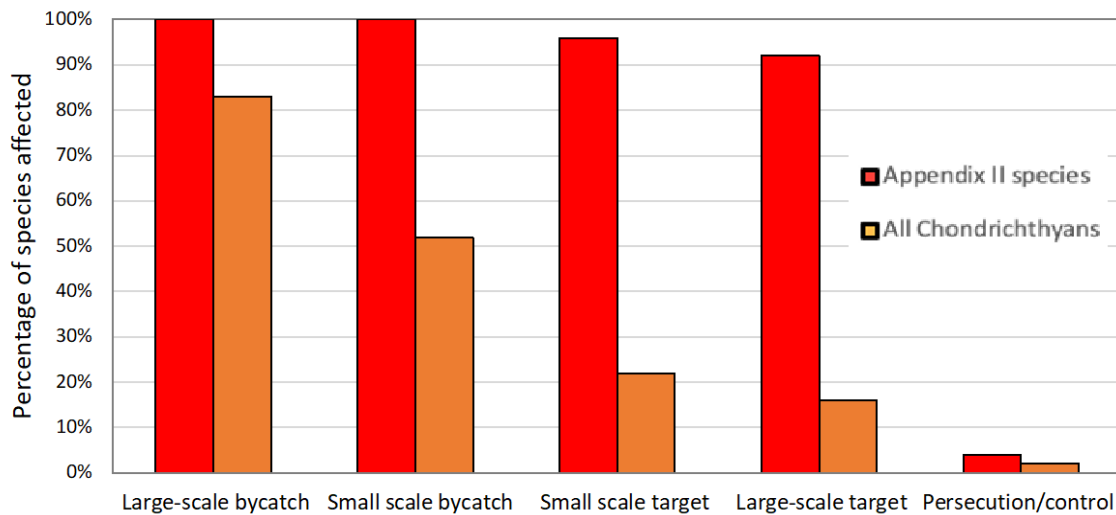


Figure 5. Proportions of CITES-listed and unlisted chondrichthyan fishes affected by fishing. (Source: www.iucnredlist.org, December 2020)

IUCN Red List data may also be used to develop Red List Indices, which are a measure of the relative risk of extinction of taxa or other species groups. The Red List Index is increasingly being used by governments to track progress towards targets for reducing biodiversity loss (<https://www.iucnredlist.org/assessment/red-list-index>). Table 5 presents Red List Indices in descending order of threat for the most threatened families, identifying CITES-listed species, and for the major taxonomic groups of chondrichthyans.

Table 5. Red List Index of selected groups of chondrichthyans and CITES-listed species. (Source: www.iucnredlist.org, January 2021, and Pacoureau et al 2021)

Taxonomic group (number of species)	Red List Index	CITES Appendix
Family Glaucostegidae, giant guitarfishes (6)	0.20	II
Family Rhinidae, wedgefishes (10)	0.26	II
Family Pristidae, sawfishes (5)	0.28	I
Family Sphyrnidae, hammerheads (9)	0.30	II (3 species)
Family Centrophoridae, gulper sharks (16)	0.52	None listed
Family Mobulidae, mantas and devil rays (9)	0.58	II
Family Lamnidae, mackerel sharks (5)	0.60	II (4 species)
All oceanic shark species (31) – see Figure 2	0.56	II (23 species)
All batoid species (602)	0.77	n/a
All shark species (536)	0.80	n/a
All chimaera species (52)	0.94	n/a

A Red List Index of 1 indicates that all species are Least Concern; an Index of 0 would mean that all species are extinct.

This brief overview of their conservation and threat status highlights the importance of strengthening fisheries management to reduce excessive or unsustainable shark mortality, whether in target or bycatch fisheries. This is equally important for unlisted threatened and near threatened species as it is for the pelagic shark and ray species listed in the CITES Appendices.

5 Fisheries and Trade status⁴

Globally, industrial and artisanal fleets supply markets in Asia for shark and ray fins and processed meat products (e.g. fish balls and surimi), while the meat of the same captured sharks in fillet form is increasingly being diverted along separate supply channels to meet demand in growing markets in Europe and South America (Dent and Clarke, 2015). Although statistical data on landings and trade in shark and ray products are available for many decades, this study focused primarily on the most recent decade for which data are available (albeit with some FAO catch data still provisional) from 2008 to 2019.

5.1 Catch data

Catches of sharks⁵ have been reported to FAO since 1950 (FAO, 2020). The total rose steadily to a peak of 888 336 metric tonnes (mt) in 2000 and has been declining slowly since then, to some 750 000 mt per year, ranging between 700 000 and 800 000 mt. Nearly 80% of recent catches were reported from the Atlantic Ocean and adjacent seas (37%, with the largest from the Eastern Central, Southwest, Northeast and Northwest), the Pacific Ocean (33%, predominantly from the Western Central, Eastern Central and Northwest), and the Indian Ocean (26%). The top 20 shark catchers⁶ for the period 2007–2018 are listed in Table 6, with trends in catches illustrated in Figure 6. Indonesia, India and Spain remain the top three shark catchers, as in previous analyses (Lack and Sant, 2009; Dent and Clarke, 2015).

Table 6. Top 20 shark catchers, 2007-2018. (Source: FAO FishStat 2020.)

Rank	Country	Mean catch/ year (mt)	Rank	Country	Mean catch/ year (mt)
1	Indonesia	111 445	12	Portugal	17 039
2	Spain	76 761	13	France	17 011
3	India	65 285	14	Japan	15 348
4	Mexico	42 260	15	Iran (Islamic Rep. of)	12 668
5	United States of America	37 260	16	Peru	10 836
6	Argentina	32 573	17	Korea, Republic of	9 948
7	Taiwan (Prov. of China)	32 543	18	Yemen	9 289
8	Malaysia	21 158	19	Pakistan	8 284
9	Brazil	19 938	20	Ecuador	7 540
10	Nigeria	19 194		Others	161 012
11	New Zealand	17 589		Total	744 980

Fischer et al. (2012) identified 26 shark catchers reporting >1% of global catches each. The seven largest accounted for ~48% of global chondrichthyan catches during 2000–2009 and, albeit in a different order, are the same top seven listed in Table 6. During the decade to 2017, however, these largest catchers' share of a smaller global reported catch had increased to 59%. Indonesia and Spain's reported catches had risen by about 4% and 5%, respectively, and increased catches reported by Mexico and USA offset a minor decline by

⁴ Section 4 draws on Okes.N & Sant.G (2019), An overview of major global shark traders, catchers and species. TRAFFIC. <https://www.traffic.org/publications/reports/major-global-shark-traders-catchers-and-species/>

⁵ For the purposes of this overview, when referring to the catches of the FAO grouping of sharks, rays and chimaera species, they are called 'sharks', unless otherwise stated.

⁶ The term "shark catchers" refers to countries, territories and other political entities reporting shark catch to FAO.

Taiwan. Two countries, Canada and the United Kingdom, had significantly reduced catches, due to more restrictive fisheries management measures. They now produce <1% of global catches. Reported catches by Thailand have also fallen significantly, from 2.6% of global reported catch to <1%. Conversely, Ecuador, Oman and Tanzania now report >1% of global catches. During 2000–2009, the 26 shark catchers reporting >1% of global catches were responsible for 85% of the total. By 2017, there were 24 entities reporting >1% of the total, and these produced 91% of the global catch. The top 40 list of shark catchers is unchanged (see Table 12, p.41).

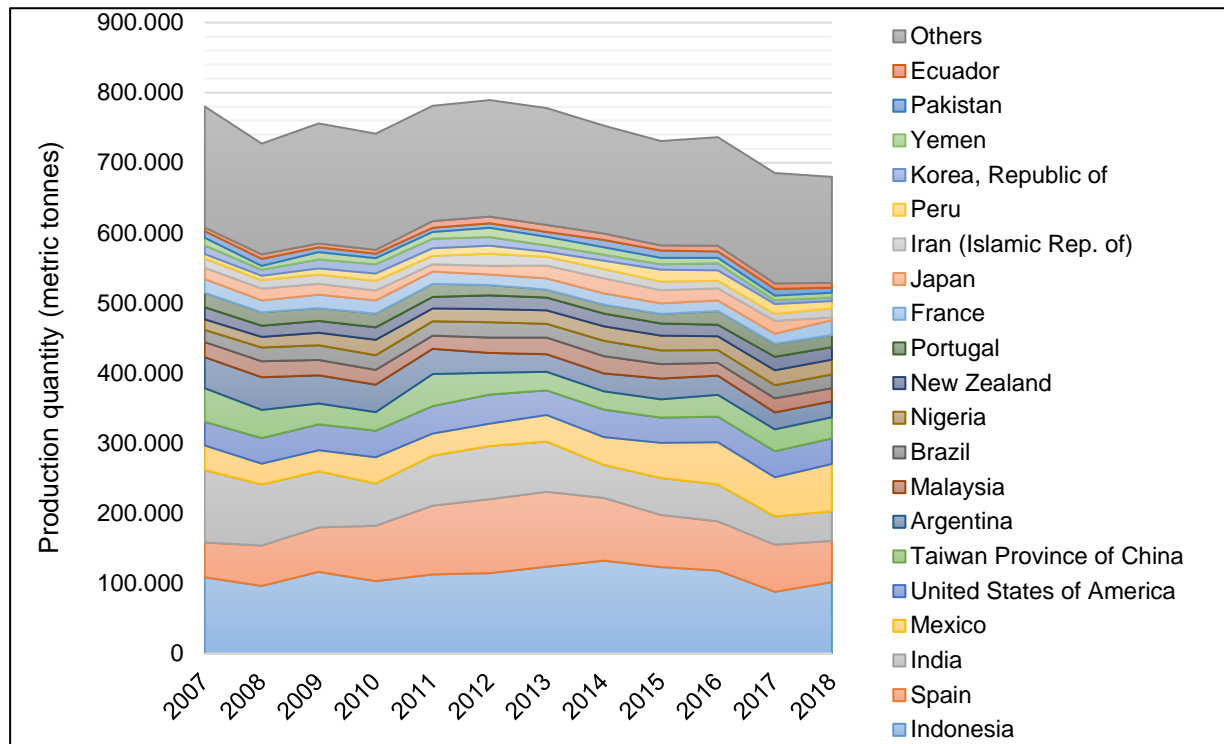


Figure 6. Chondrichthyan catch trends in the top 20 shark fishing countries, 2007–2018.

A total of 153 species of sharks and a further 28 taxonomic groupings of shark, ray and chimaera species are recorded as caught by international fisheries worldwide (FAO, 2019). Although landings may be recorded at species level within a country, the majority of catches are recorded in general shark groups and not at species level when aggregated for submission to the FAO (Cashion et al. 2019). In 2008, 76% of all shark catches were recorded under broad groupings and only 24% at the species level. The most commonly used group was ‘Sharks, rays, skates etc, nei’ (nei: not elsewhere recorded), with 35% of all shark catches recorded in FishStat under this category. There has been slight improvement over the last ten years (Cashion et al. 2019), with more catches being recorded at the species level in some regions. In 2017, 62% of global reported catches were recorded within taxonomic groupings, including 19% under the category ‘Sharks, rays, skates etc, nei’, and 38% at species level. These analyses do not permit estimates of the quantities of sharks (and other taxa) that are reported as unidentified fishes. A few countries with large landings of marine fishes still do not report any catches of sharks and rays.

Because a large proportion of the catch is recorded in broad taxonomic categories, it is difficult to identify many global-level taxon-specific trends in reported catches. However, changes in catch per grouping and species are tabled in Annex 6. Catch trends for some frequently-recorded CITES-listed species and the unlisted but important blue shark are highlighted here:

Blue shark *Prionace glauca* FishStat records start in 1950, when FAO records begin but very few other sharks were being reported. Global catches rose steadily from the late 1990s, when blue shark comprised about 5% of all landings, to 81 437 mt (11%) by 2008 and steeply to >130 000 mt in 2011. They peaked at 137 973 mt (almost 18%) in 2013 before declining rapidly to 103 528 mt in 2017 and 100 000 mt in 2018 (FAO, 2020). Because there were no regional catch limits until ICCAT established TACs in 2019, this may indicate a genuine population decrease. However, 16% of reported global shark catch is still comprised of blue shark.

Silky shark *Carcharhinus falciformis* reported landings in the Eastern Indian Ocean, the majority of which are by Sri Lanka, have been declining since reaching a peak of nearly 25 000 mt in 1999. They had fallen to 4 610 mt by 2010, 632 mt in 2017 and 715 mt in 2018. Although most tuna RFMOs have prohibited landings of silky shark (e.g. ICCAT since 2012, WCPFC since 2014 and IATTC since 2017), this species is not prohibited in the Indian Ocean. These falling catches are likely due to a population decline, although FishStat data for the Atlantic and Pacific do not reflect the concerns that led to RFMO prohibitions in these oceans. The CITES Appendix II listing of silky shark came into effect in 2017.

Mobulid rays (Family Mobulidae) FAO reported landings of 'Mantas, devil rays nei' have almost doubled over the past decade. Some of this increase may be due to improved taxonomic reporting, and some to new fisheries supplying developing markets for mobulid gill plates. Catches in the Eastern Indian Ocean rose from 136 mt in 2008 to 2 647 mt in 2016, and peaked in the Western Central Pacific at 5 857 mt in 2018. The majority of landings in these ocean regions were reported by Indonesia, followed by Sri Lanka. IATTC prohibited landing or retention of mobulids in 2015, followed by GFCM in 2018 and both IOTC and WCPFC in 2019. The CITES Appendix II listing of the largest Manta rays came into effect in 2014, and all other *Mobula* species in 2017.

5.2 Trade data

Shark catches are exported as either meat (usually fresh or frozen) or fins (dried or frozen), and products in trade are recorded using the World Customs Organization (WCO) Harmonised System (HS). Table 7 presents the HS codes and their descriptions for shark products in trade used to source country specific data from UN Comtrade (the UN International Trade Statistics Database). The trade dynamics and consumer markets for meat and fin products are quite different and are therefore summarised separately here. Since shark fin specific codes were only available from 2012 from UN Comtrade, data on shark fin trade was sourced from FAO (2020), and data on shark meat was sourced from UN Comtrade (2008–2019).

As noted by Dent and Clarke (2015), species data are only rarely identified in trade records for shark meat and never for shark fins (outside the CITES trade database). As a result, it has not been possible to identify shifts in utilization between species, for example, when less-resilient species are fished down or enter management, and more-prolific, unrestricted species such as blue shark replace them in global markets. New research (see below), however, will now allow species-specific trends to be monitored in the shark fin markets of Hong Kong SAR and mainland China.

Meat: An annual average of 114 000 mt of shark meat products were reported as imported over the period 2008–2019. Both quantities traded and reported value have declined since 2011 (Figure 7) with the average value of imports being USD 283 000 per year. The majority of reported imports were traded in frozen form (on average 87% of annual imports) and fresh form (average 13%).

The top 20 importers of shark meat account for 90% of the global average annual imports over the last 12 years (2008–2019). Europe and South America are the largest retail markets for shark meat (Figure 8), although trade in Asia of highly processed meat, such as fish balls or surimi, may not be recorded as shark and domestic landings also supply local markets with meat. The top countries from which they import (i.e. top exporting countries) include Spain, Taiwan, Uruguay, USA, Argentina, Portugal, Japan, Namibia, and Indonesia. Figure 11 illustrates the major trade flows (>1000 mt) of shark meat recorded over the last five years (2015–2019). Several countries are both major importers and exporters (e.g., Spain, Uruguay, Portugal, Peru). It appears that blue shark may now be dominating meat markets in Japan, Spain, Taiwan Province of China and Uruguay (Dent and Clarke, 2015), and Uruguay re-exports significant quantities to Brazil.

Table 7. Shark product HS codes used in trade, 2008–2019.

HS Code	Meat	HS Code	Fins*
30265	Dogfish & other sharks, fresh/chilled (excl. fillets/other fish meat of 03.04/livers & roes)	(*Fin specific codes available only from 2012)	
30281	Fish; fresh or chilled, dogfish and other sharks, excluding fillets, livers, roes, and other fish meat of heading 0304	30292	Fish; fresh or chilled, shark fins
30282	Fish; fresh or chilled, rays and skates (Rajidae), excluding fillets, livers, roes, and other fish meat of heading 0304	30392	Fish; frozen, shark fins
30375	Dogfish & other sharks, frozen (excl. fillets/other fish meat of 03.04/livers & roes)	30571	Fish; edible offal, shark fins
30381	Fish; frozen, dogfish and other sharks, excluding fillets, livers, roes, and other fish meat of heading 0304	160418	Fish preparations; shark fins, prepared or preserved, whole or in pieces (but not minced)
30382	Fish; frozen, rays and skates (Rajidae), excluding fillets, livers, roes, and other fish meat of heading 0304		
30447	Fish fillets; fresh or chilled, dogfish and other sharks		
30448	Fish fillets; fresh or chilled, rays and skates (Rajidae)		
30456	Fish meat; excluding fillets, whether or not minced; fresh or chilled, dogfish and other sharks		
30457	Fish meat; excluding fillets, whether or not minced; fresh or chilled, rays and skates (Rajidae)		
30488	Fish fillets; frozen, dogfish, other sharks, rays and skates (Rajidae)		
30496	Fish meat, excluding fillets, whether or not minced; frozen, dogfish and other sharks		
30497	Fish meat, excluding fillets, whether or not minced; frozen, rays and skates (Rajidae)		

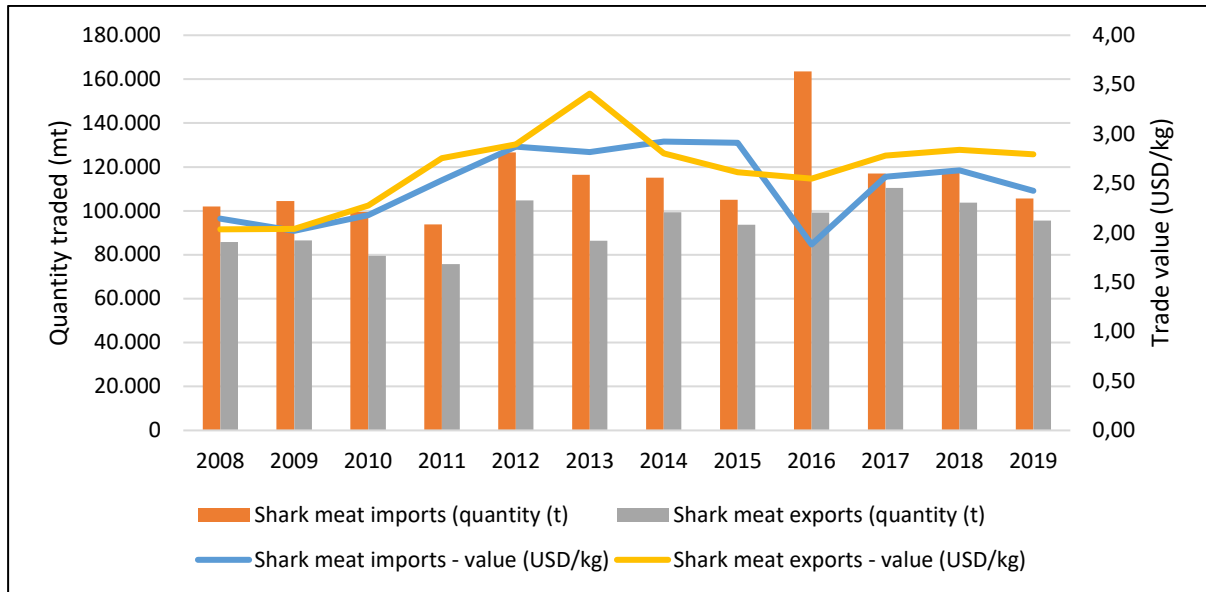


Figure 7. Global shark meat trade, quantity (metric tonnes) and value (1000 USD), 2008–2019. (Source: UN Comtrade.)

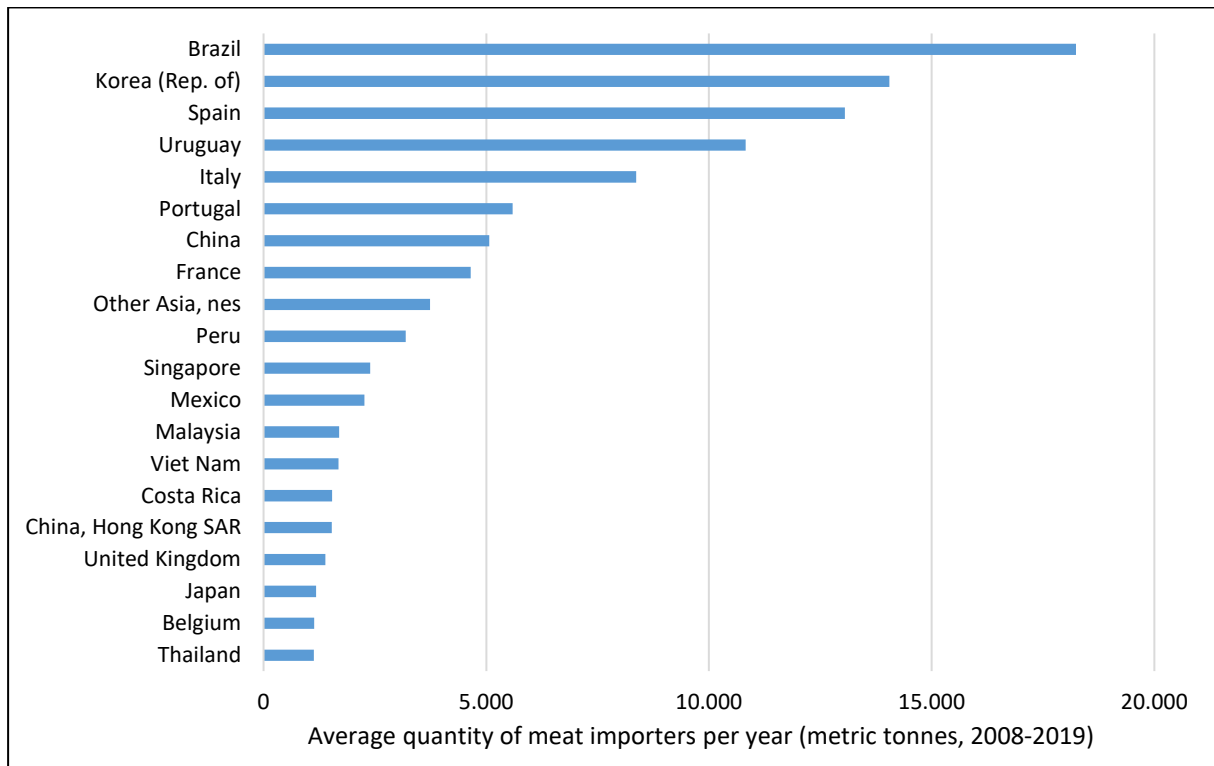


Figure 8. The top 20 importers of shark meat, 2008–2019. (Source: UN Comtrade.)

Fins: An average of 16 502 mt of shark fin products (with an average value of USD 323 million per year) were reported as imported during 2000–2018 (Figure 9; FAO, 2020). Quantities traded and reported value have fluctuated over this time period, with the overall trend showing a decline. The majority of reported imports were traded as ‘Shark fins, dried, whether or not salted’ (on average 50% of annual imports, 2000–2018), ‘Shark fins, salted and in brine but not dried or smoked’ (average 19%) and ‘Shark fins, prepared or preserved’ (average 19%).

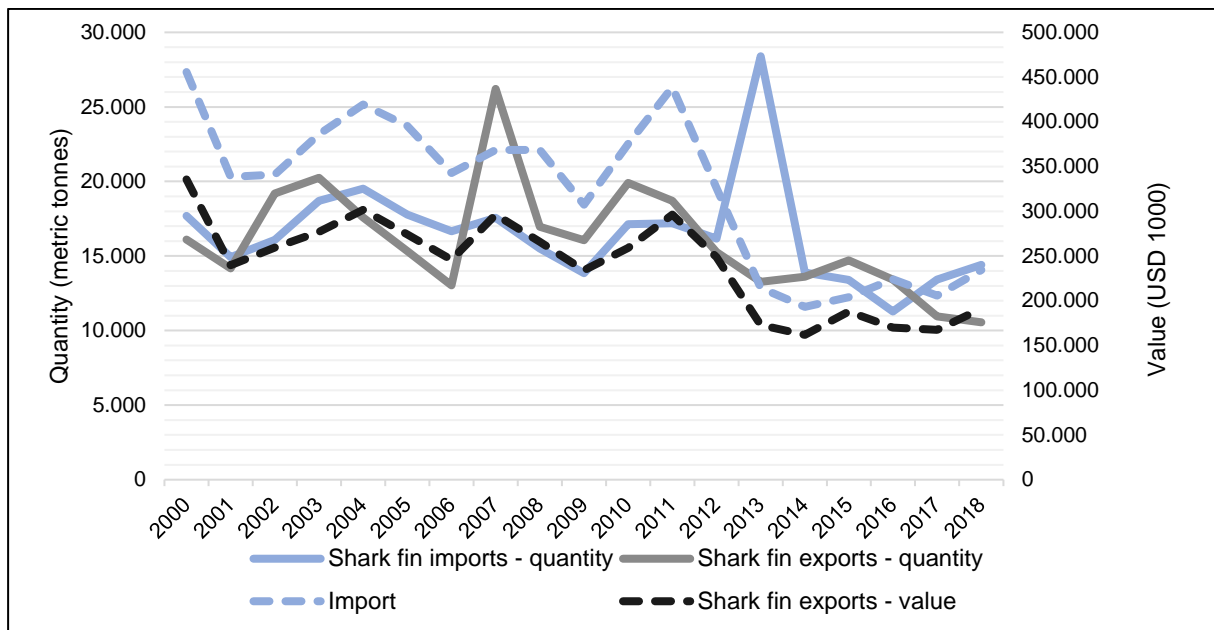


Figure 9. Global shark fin trade quantity (metric tonnes) and value (1000 USD) 2000-2018. (Source: FAO 2020)

It is important to note that the global shark fin trade data summarised in Figure 9 include some double-counting of imports and re-imported products, and that frozen raw and processed canned fins contain a substantial weight of water compared with dried raw and processed fins. The unit value of imported unprocessed frozen or dried shark fin is also much lower than that of re-exported processed fin.

The world’s four largest importers of shark fin accounted for almost 90% of average annual global imports of fins during 2000-2018 (Figure 10). Hong Kong, China SAR, is the largest, importing an average of 8 624 mt of shark fin a year over this period, followed by Malaysia (average 2 504 mt/year – although this is influenced by an unusually high volume of processed fin imported in 2013), China (1 862 mt/year) and Singapore (1 576 mt/year). Fins moving between Hong Kong SAR and mainland China do not appear in Comtrade statistics, although they are reported in Hong Kong’s external merchandise trade statistics. Hong Kong imported fins largely from Singapore, Taiwan, Spain, Peru, United Arab Emirates and Indonesia, although Hong Kong Customs records report trade with an average of 83 nations annually (Shea & To 2017). Singapore, which is a trade hub, not a fin producer, imported fins largely from Spain, Namibia, Uruguay, Taiwan and Indonesia (UN Comtrade).

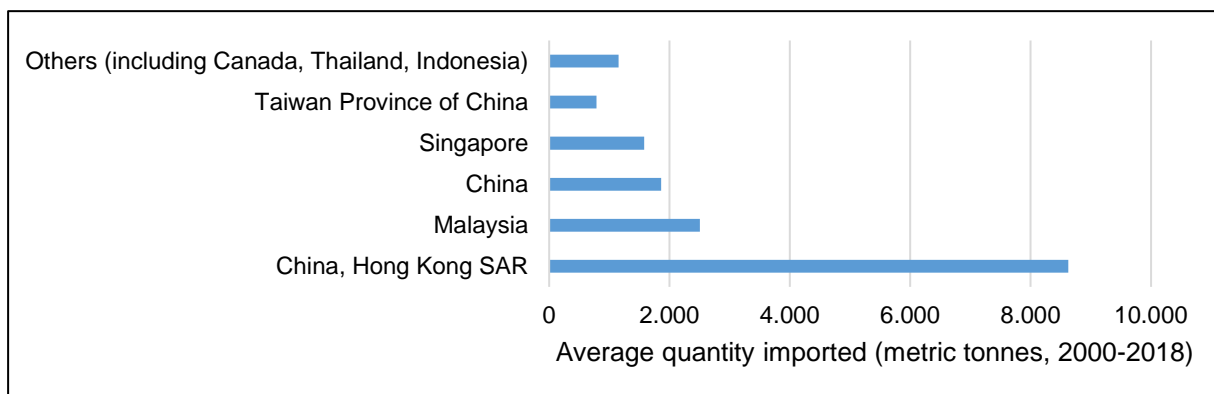


Figure 10. Major shark fin importers and their average annual reported imports (metric tonnes), 2000-2019. (Source: FAO 2020)

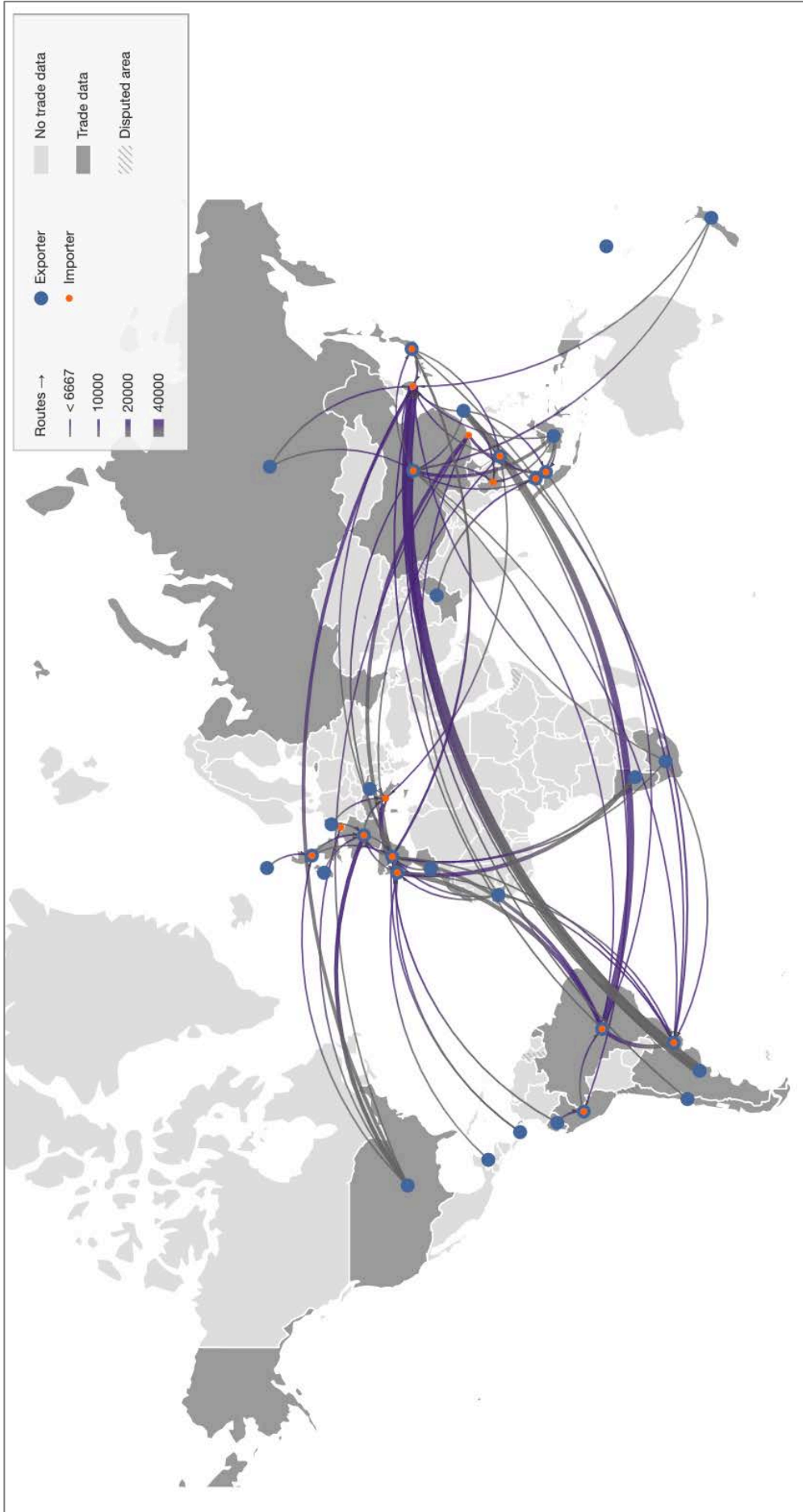


Figure 11. Major trade flows (>1000 metric tonnes over five years) of national shark meat imports recorded during 2015–2019. Source: UN Comtrade. This map only shows trade flows >1000 tonnes/5 years; numerous smaller trade routes are not illustrated. Legend units are in mt.



Figure 12. Major trade flows (> 300 metric tonnes over five years) of national shark fin imports recorded during 2015–2019. Source: UN Comtrade. This map only shows trade flows >300 mt/5 years; numerous smaller trade routes are not illustrated. Legend units are in mt.

Table 8. Taxa identified from the Sheung Wan and Sai Ying Pun fin markets, Hong Kong, ranked by frequency (Fields et al. 2017)

Common name	Species	IUCN Red List*	CITES	CMS	Body size	Habitat	Percentage of samples
<i>Prionace glauca</i>	Blue Shark	NT		II	large	oceanic	34.0%
<i>Carcharhinus falciformis</i>	Silky Shark	VU	II	II	large	oceanic	10.1%
<i>Carcharhinus limbatus</i> complex, incl: <i>C. amblyrhynchoides</i> , <i>C. leiodon</i> , <i>C. tilstoni</i> sharks	Blacktip shark, Graceful shark, Smoothtooth & Australian blacktip sharks	NT/LC			large	coastal	4.1%
<i>Sphyrna lewini</i>	Scalloped hammerhead	CR	II	II	large	coastal	4.1%
<i>Sphyrna zygaena</i>	Smooth hammerhead	EN	II	II	large	coastal	3.4%
<i>Isurus oxyrinchus</i>	Shortfin mako	EN	II	II	large	oceanic	2.8%
<i>Carcharhinus</i> spp.	Requiem Sharks	35% threatened			large	various	2.4%
<i>Carcharhinus leucas</i>	Bull Shark	NT			large	coastal	1.8%
<i>Rhizoprionodon acutus</i>	Milk Shark	LC			small	coastal	1.4%
<i>Carcharhinus brevipinna</i>	Spinner Shark	NT			large	coastal	1.2%
<i>Carcharhinus amblopinis</i>	Pigeon Shark	DD			large	coastal	1.1%
<i>Dalatis licha</i>	Kitlefin Shark	NT			large	deep benthic	1.1%
<i>Carcharhinus sorrah</i>	Spot-tail Shark	NT			large	coastal	1.0%
<i>Carcharhinus longimanus</i>	Oceanic whitetip Shark	CR	II	II	large	oceanic	1.0%
<i>Carcharhinus obscurus</i> / <i>C. galapagensis</i>	Dusky/Galapagos Shark	VU/NT		II	large	coastal	0.9%
<i>Sphyrna mokarran</i>	Great hammerhead	CR	II	II	large	coastal	0.9%
<i>Alopias superciliosus</i>	Bigeye thresher Shark	VU	II	II	large	oceanic	0.8%
<i>Negaprion acutidens</i>	Sicklefin lemon Shark	VU			large	coastal	0.6%
<i>Callorhynchus</i> spp.	Plough-nose Chimaeras	LC			small	deep	0.6%
<i>Rhynchobatus australiae</i> complex	White-spotted guitarfishes complex	CR	II	II	large	coastal	0.5%
<i>Rhizoprionodon taylori</i>	Australian sharpnose Shark	LC			small	coastal	0.5%
<i>Carcharhinus limbatus</i>	Blacktip Shark	NT			large	coastal	0.4%
<i>Chiloscyllium</i> spp.	Bamboo Sharks	NT			small	coastal	0.4%
<i>Alopias pelagicus</i>	Pelagic thresher Shark	EN	II	II	large	oceanic	0.4%
<i>Centrophorus</i> spp. (10 spp)	Gulper Sharks	30% threatened, 70% DD			small	deep benthic	0.4%
<i>Galeorhinus galeus</i>	Soufin Shark	VU			large	oceanic	0.4%
<i>Lamna ditropis</i>	Salmon Shark	LC			large	oceanic	0.4%
<i>Mustelus</i> spp. (27 spp)	Smoothhound Sharks	15% threatened, 44% DD			small	coastal-shelf	0.4%

The Red List assessments are from Fields et al. 2017; several have since been updated – see Table 1.

As well as being among the world's largest shark fin consumers, some of the major shark fin importers are important centres for processing dried and frozen fin imports, a proportion of which is subsequently re-exported in processed form all over the world. Figure 10 (UN Comtrade) presents the major trade flows of imports (including re-imports) of shark fin recorded by importing countries over the last five years (2015–2019). In order to highlight the largest importers and exporters, and for consistency of comparison with previous studies (Dent and Clarke, 2015), only trade flows exceeding 300 mt between 2015 and 2019 are shown.

Although trade statistics are not species-specific, genetic analyses have confirmed that 11 of the approximately 30 fin categories used by traders in Hong Kong auctions to refer to a species or species group, including some CITES-listed species (Clarke et al. 2006a, 2006b). These authors examined trader records from October 1999 to March 2001 and were able to estimate numbers of individual sharks supplying fins for the trade globally as well as the proportional contributions of 14 of the most commonly traded species. These taxa comprised about 46% of the auction volume for that period.

It is not possible to repeat this study, but Fields et al. (2018) and Cardeñosa et al. (2017, 2018 a & b) have developed new techniques that enable a much wider range of species to be identified from by-products of the fin processing industry (see Table 8). This will allow future trends to be monitored, although it will not identify imported fins that do not require trimming. Twelve species were found in more than 1% of samples, five of which are listed in CITES Appendix II. Four species contributed >50% of samples and CITES-listed species >20%. Furthermore, current genetic investigations using genomics are now able to identify such fine-scale population structure within a single species that samples may be identified to their ocean or stock of origin (e.g. Benavides et al. 2011; Clarke et al. 2015; Chapman et al. 2009; Galván-Tirado et al. 2013).

5.3 Catch and trade in CITES-listed species

Most CITES-listed shark species are targeted or retained primarily to trade their fins. A few species, including Whale shark *Rhincodon typus* (listed in CITES Appendix II and effective in 2003), Porbeagle shark *Lamna nasus* (2006) and Shortfin mako *Isurus oxyrinchus* (2019) are more highly valued and targeted for meat, with their fins often being a by-product (Annex 1). Many CITES Appendix II species are globally distributed pelagics, caught throughout all oceans as a target or bycatch of pelagic longline gear, and as a bycatch in purse-seine and gillnet gear targeting tuna, swordfish and other billfish. Due to their broad distribution, often migratory nature, and occurrence in fisheries managed by the tuna RFMOs, these species fall under the remit of the tuna RFMOs and some are subject to region-specific conservation and management measures (CMMs). The following analyses are based primarily on FAO data (some RFMOs have more detailed observer records, not reviewed by this study).

Thresher sharks, Genus Alopias (CITES Appendix II, effective since 2017):

Two of the three species (Bigeye thresher *Alopias superciliosus* and Common thresher *A. vulpinus*) have a circumglobal distribution, while Pelagic thresher *A. pelagicus* is an Indo-Pacific species. All are caught by longline fisheries throughout their range, with some also captured in gillnets, and their meat and fins are utilised. These species are frequently reported by genus, as 'Thresher sharks nei', which is applied to 77% of the thresher shark catches reported to FAO. It is therefore very difficult to determine the relative abundance of each species in regional catches. During the last ten years (2008–2017), the Pelagic thresher shark was only reported to species level in the Southeast Pacific, landed by Ecuador (representing 21% of global catches for the genus), although other range States also land this species. Bigeye thresher shark was reported primarily in the southeast Pacific Ocean, also landed by Ecuador, followed by Mexico in the Western Central Atlantic and Brazil in the Southwest Atlantic (FAO, 2018). Common thresher was reported from the Northeast Atlantic, landed by France; and in the Northwest Atlantic, Western Central Atlantic and Eastern Central Pacific, landed by United States. All three species are traded primarily for their fins

and fetch high prices in market destinations such as Indonesia, Singapore and Japan (Dent and Clarke, 2015), although there are also markets for their relatively high value meat, which has driven some historic, primarily domestic, fisheries (e.g. on the US Pacific coast).

Hammerhead sharks, Genus Sphyrna (CITES Appendix II, effective since 2014):

The three large species of hammerhead sharks (Scalloped hammerhead *Sphyrna lewini*, Great hammerhead *S. mokarran* and Smooth hammerhead *S. zygaena*) are also traded primarily for their fins and are amongst the preferred species for shark fin soup (Dent and Clarke, 2015). Scalloped and Great hammerhead sharks are found worldwide in coastal temperate and tropical waters. The Smooth hammerhead is found in similar coastal and open ocean temperate and tropical waters, but has a wider range extending into higher latitudes than the other large hammerhead species. All three are caught in both targeted fisheries (longline, gillnet, handline and trolling) and to a lesser extent as bycatch in purse seine fisheries. As for the thresher sharks, these species are frequently reported by genus, as 'Hammerhead sharks nei', which is applied to 94% of the catch reported to FAO. Unlike the threshers, this category includes some unlisted threatened species of smaller-bodied hammerhead shark, likely in low volumes. According to catch statistics (FAO, 2019), Great hammerhead (which was first reported to FAO in 2013) is reported in the lowest numbers of the three listed species and caught predominantly by the United States in both the Northwest and Western Central Atlantic Oceans. Scalloped hammerhead is reported predominantly by Mauritania in the Eastern Central Atlantic Ocean; Brazil in the Southwest Atlantic; Ecuador in the Southeast Pacific and the USA in the Western Central Atlantic, although this species is an important catch in a much larger number of range States. The majority of Smooth hammerhead is reported from fisheries in the Eastern Central Atlantic, landed by Morocco, Spain and Portugal; and in the Southeast Pacific, landed by Ecuador.

Silky shark Carcharhinus falciformis (CITES Appendix II effective since 2017):

Silky shark has a circumglobal distribution. It is caught in some targeted fisheries and is a common incidental catch in coastal longline and gillnet fisheries, and in oceanic longline and purse seine fisheries. Over the last ten years, the majority of reported catches of Silky shark was reported landed in the Eastern Indian Ocean by Sri Lanka; also Costa Rica in the Eastern Central Pacific; and Iran in the Western Indian (FAO, 2019). The retention of Silky shark is now prohibited in many oceanic pelagic fisheries outside the Indian Ocean (IATTC 2016, ICCAT 2011, WCPFC 2013), although the large longline fisheries on the Latin American Pacific coast are exempted from the IATTC measure. Silky shark is still traded for both meat and fins, with the fins considered high value, and this is the second most commonly traded species in the fin trade (Fields *et al.* 2017; & Cardeñosa *et al.* 2017).

Oceanic whitetip Carcharhinus longimanus (CITES Appendix II effective since 2014):

The Oceanic whitetip shark is found in epipelagic tropical and subtropical waters worldwide and caught as bycatch in longline and purse seine fisheries throughout its range, but has been greatly depleted in recent decades. Retention of Oceanic whitetip is now prohibited by all the tuna RFMOs (IATTC in 2011, ICCAT in 2010, IOTC in 2013 and WCPFC in 2011), with the collection of data on discards and live release mandated. Landings reported to the FAO showed an average of 458 mt landed per year (2008–2017; FAO 2019) although with the adoption of the tuna RFMO prohibitions and the CITES Appendix II listing during 2010-2014, this has decreased in recent years to 65 mt in 2016 and 62 mt in 2017. Prior to the tuna RFMO prohibitions and CITES listing, Brazil consistently reported landings from the southwest Atlantic. The majority of catch in more recent years was reported from the Eastern Indian Ocean, landed by Sri Lanka, and the Western Indian Ocean, landed by the Islamic Republic of Iran (FAO, 2019).

Mantas and Devilrays, Genus Mobula (CITES Appendix II effective since 2014-2017):

A new emerging trade in Mobulid ray species was recognised in 2013 (IUCN/TRAFFIC, 2013; Dulvy *et al.* 2014). CITES Appendix II came into effect for the Mantas in 2014, and the other

members of genus *Mobula* in 2017. Mobulids were traditionally utilised for their meat, but the largest species are now targeted specifically for their gill plates, which are marketed as a medicinal product in Asian communities (Ward-Paige et al. 2013). Mobulid rays are found worldwide in tropical and temperate waters and caught in targeted fisheries as well as an incidental catch in a variety of gear types, including harpooning, netting, trawling, purse seine, gillnets and longlines. Some of the two Manta species (now reclassified as *Mobula*) and nine other species of *Mobula* rays are difficult to identify and distinguish without an identification guide, and are not recorded to species level in catch and trade data. The FAO currently compiles catch records for 30 ray species at species level, including the Giant Manta ray, and eight groupings of species that include rays – one of which is for the mobulid rays ‘Mantas, devil rays nei’ (FAO, 2019). Catches for this category have increased over the period 2008-2017, with an average catch of 4 462 mt per year. The majority of catches in recent years were from the Western Central Pacific, landed by Indonesia; and the Eastern Indian Ocean, landed by Indonesia and Sri Lanka. IATTC has prohibited the landing or retention of mobulids on board since 2015 (exempting coastal fisheries). IOTC and WCPFC adopted similar measures in 2019.

Shortfin and Longfin Mako Isurus oxyrinchus & Isurus paucus (CITES Appendix II effective since 2019):

Mako sharks occur globally in temperate and tropical oceans and are highly migratory in nature. Shortfin mako is caught throughout all oceans by over 20 catchers. It is a common secondary catch in tuna and billfish longline and driftnet fisheries, particularly in high-seas fisheries, and also an important coastal recreational species. It is highly valued for its meat, also fins and skin, and was ranked as the 5th most common species in the fin trade in Hong Kong SAR (Table 8, Fields et al., 2017). Oil is extracted for vitamins, and jaws and teeth are also sold as ornaments and trophies. Current management measures implemented by RFMOs include a binding recommendation for the North Atlantic stock whereby live release (but with many exemptions) is required for ICCAT members (BYC 17-08; 2017), and GFCM prohibits the retention of Shortfin Mako (GFCM/36/2012/3). Longfin mako is reported by fewer catchers, mainly Portugal and Spain in the Pacific and Atlantic Oceans. It is a secondary catch in tropical pelagic longline fisheries for tuna, swordfish and sharks and in other oceanic fisheries, which operate throughout its range. The products utilised include fresh, frozen, and dried or salted meat for human consumption. Fins are of higher relative value compared to the carcass and are known to enter the international fin trade (Reardon et al., 2006). Both Shortfin and Longfin makos are assessed as Endangered globally in the IUCN Red List of Threatened Species (Rigby et al., 2019a, b) and in 2019 were included in CITES Appendix II. Furthermore, although a proposal to ICCAT to implement scientific advice by prohibiting catch of North Atlantic Shortfin mako was unsuccessful, the EU recently issued a negative CITES Non-Detriment Finding (NDF), meaning that EU Member States will not trade sharks from this population (including existing stockpiles) from January 2021.

Wedgefishes Family Rhinidae (CITES Appendix II, effective since 2019):

Recent awareness over the susceptibility of wedgefishes to over-exploitation has highlighted the need for their improved management and conservation (Dulvy et al., 2014; Moore, 2017). The family Rhinidae (commonly referred to as wedgefishes) consists of ten species. It is the second most threatened family of chondrichthyans globally with 90% of species classified as “Critically Endangered” on the IUCN Red List. The Wedgefishes typically occur in inshore habitats on the continental shelf, including shallow bays, estuaries and coastal coral reefs, mainly in the Indian and Pacific Oceans (Compagno & Last 1999). They are caught by artisanal and commercial fisheries both as target species and as secondary catch in demersal trawl, net, and longline fisheries (Jabado, 2018). Wedgefish fins are considered amongst the best quality and highest value in the shark fin trade (Dent and Clarke, 2015) and are increasingly being found fetching high prices on markets in Hong Kong SAR and Singapore (Wainwright et al., 2018; Fields et al., 2017). As they are primarily coastal species, international management through RFMO regulations is limited, but in 2019 trade was regulated through the inclusion of all ten species within CITES Appendix II.

Giant guitarfishes Family Glaucostegidae (CITES Appendix II, effective since 2019):

The family contains six species of giant guitarfishes in genus *Glaucostegus*, all classified as Critically Endangered and threatened by unmanaged and unregulated fisheries and trade (Kyne *et al.*, 2019a). This is the world's most threatened family of chondrichthyans. At least two species, *Glaucostegus cemiculus* and *G. granulatus*, are known to be targeted in West Africa, Northwest Indian Ocean, and South Asia (Jabado, 2018). They occur mainly in shallow coastal waters and are caught in many gear types, including trawls, gillnets, seine nets, and hook and line (Kyne *et al.*, 2019b). Similar to wedgefishes, they are largely traded for their high value fins and occur in markets in Hong Kong SAR (Fields *et al.*, 2017). To regulate trade, the six species of guitarfish were included within CITES Appendix II in 2019.

5.4 Risk of Overexploitation

In 2014, in order to facilitate efforts to improve management of shark catches, a rapid risk management framework suitable for marine taxa was developed and applied to species of shark with medium to high intrinsic vulnerability (Oldfield *et al.* 2012; Sant *et al.* 2012; Lack *et al.* 2014). The assessment combined information on three elements for each shark species – stock status, species-specific management and generic management – in order to determine an overall score representing the shark species' or stock/s' overall risk of overexploitation due to poor management (Lack *et al.* 2014). This process can be used to prioritise shark species of greatest concern, and identify where improvement or implementation of new management measures is most needed. Preliminary analyses covered 173 shark management units (or shark stocks) for 46 species (see Annex 1 for the species assessed). Of those, 150 were assessed as having a high management risk and 23 as having a medium management risk (Lack *et al.* 2014). The overall risk rating for each of the CITES-listed and other significant species is listed in Annex 1 by management unit or stock. The assessment allows for the identification of additional management intervention for priority species and is a valuable tool for monitoring the effectiveness of management measures in the future.

6 Management status

Management action for sharks listed in the CITES Appendices can be taken at international, regional, or national level. Resolution Conf. 12.6 (Rev.CoP18) on the conservation and management of sharks recognises the duty of all States to cooperate, either directly or through appropriate sub-regional or regional organisations in the conservation and management of fisheries resources, and instructs the CITES Secretariat to maintain close collaboration with FAO, Regional Fisheries Bodies and the Convention on the Conservation of Migratory Species. This section focuses upon the international and regional advice, recommendations and resolutions produced by multilateral environmental agreements (MEAs); the role of Regional Fishery Bodies (RFBs); and key national measures.

6.1 International management

6.1.1 United Nations Convention on the Law of the Sea (UNCLOS)

UNCLOS Article 64 urges coastal States and other fishing States to cooperate to ensure the conservation and optimum utilisation of Annex I species, directly or through appropriate international organizations, within and beyond the exclusive economic zone. Annex I, Highly Migratory Species, lists most of the CITES Appendix II-listed pelagic sharks, with the majority listed at family level (threshers, carcharhinids, hammerheads and makos). This multilateral cooperation is currently being delivered through several UN bodies concerned with fisheries management and biodiversity conservation.

6.1.2 United Nations Food and Agriculture Organization (UN FAO)

In 1999, FAO adopted the voluntary International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks), one of several IPOAs elaborated within the framework of the Code of Conduct for Responsible Fisheries. It applies to States in the waters of which sharks are caught by their own or by foreign vessels and to countries whose fleets catch sharks on the high seas. The IPOA-Sharks urges States to develop National Shark Plans. It also envisages cooperation through regional or sub-regional fisheries organizations and the development of regional or sub-regional Shark Plans.

The FAO Agreement on Port State Measures (PSMA) to Prevent, Deter and Eliminate Illegal, Unreported, and Unregulated (IUU) Fishing, adopted in 2009, came into force in 2016. By obligating its Parties to manage ports under their jurisdiction, with the goals of detecting illegal fishing, intercepting illegally caught fish, and sharing information on vessels engaging in IUU fishing, the PSMA mandates States to ensure compliance with RFMO regulations and other taxon-specific management measures (including CITES).

6.1.3 United Nations Environment Programme (UNEP)

UNEP administers the Secretariats for CITES and CMS, the two major multilateral environmental agreements addressing the management of sharks, and the Regional Seas Programme (see below).

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) was established to protect species from over-exploitation through international trade. It recognizes the need for international cooperation between range States and consumer States to achieve this. Appendix I species cannot enter international trade for commercial purposes, although non-commercial transactions are permitted. Appendix II applies to species that may become threatened unless their trade is strictly regulated, to ensure that trade is legal, sustainable and traceable. Appendix III species that are protected in at least one country, which has asked other CITES Parties for assistance in controlling trade. (Appendix III listings were not reviewed in this study.)

CITES Authorities must issue an export permit before specimens (including parts and products) of species listed in CITES Appendices may enter international trade. This requires the responsible

Authorities to be satisfied that they derive from individuals that have been legally acquired and that their removal from the wild is not of detriment to the survival of the respective population of the species concerned. That is: the export needs a 'Legal Acquisition Finding' (LAF) from the Management Authority, and a "Non-Detriment Finding" (NDF), from the Scientific Authority. These procedures ensure that the traded specimens were captured legally and sustainably, and enable exports, imports and re-exports to be tracked. CITES provisions also apply to listed species caught on the high seas, retained and landed, which applies to several pelagic sharks and rays. In such cases, the flag State of the fishing vessel must issue an "Introduction from the Sea" (IFS) Certificate or Export Permit, depending on whether they are landing the species in their own port or the port of another State. While issuing this documentation is a sovereign State responsibility, CITES recognizes that Regional Fishery Bodies can have a role in advising Parties on the sustainability of fisheries for Appendix II species and building capacity. For example, the Southeast Asian Fisheries Development Center (SEAFDEC) has been running training courses for some of its members to assist them with the preparation of their NDFs.

The Convention on the Conservation of Migratory Species of Wild Animals (CMS) currently lists 40 species of coastal and pelagic sharks and rays in its Appendices (unlike CITES, a species can be listed in both). These include all of the pelagic sharks and mobulid ray species listed in the CITES Appendices (see Table 9). All species listings in the CMS Appendices should be supported by a Concerted Actions list, including a specification of the conservation and institutional outcomes expected from each action and timeframes for achievement, but these still need to be developed for many shark species.

CMS Appendix II includes migratory species with an unfavourable conservation status, whose conservation requires collaboration between Parties. Appendix I lists endangered species which require strict protection (defined as prohibiting their take⁷). Thus, CMS provides a framework within which Parties to CMS may adopt strict protection measures for migratory species listed in Appendix I (although few had done so by 2019⁸). CMS Parties that have fully implemented this measure are unlikely to be able to issue CITES LAFs for protected species listed in CMS Appendix I.

The voluntary CMS Memorandum of Understanding for the Conservation of Migratory Sharks (Sharks MoU) is open to signature by Parties and non-Parties to CMS, and to cooperating partner non-governmental bodies. It aims to facilitate and coordinate conservation activities for the species included in its Annex 1, most of which are listed in the CMS Appendices. The MoU Conservation Action Plan seeks to improve research, fisheries management, habitat protection, public awareness, and cooperation at national and international scales. Signatories are encouraged to pursue these activities through Regional Fisheries Management Organizations (RFMOs). The MOU Conservation Working Group is tasked, *inter alia*, with reviewing the work of FAO, RSCAPs, RFMOs, and RFBs and other relevant organisations involved in species in Annex 1 and identifying research, management and information gaps that may be addressed by the MoU, including key regions and capacity-building needs in areas not covered by RFMOs.

⁷ Defined as "taking, hunting, fishing, capturing, harassing, deliberate killing, or attempting to engage in any such conduct."

⁸ Lawson and Fordham (2019) examined the legislation of 83 CMS Parties that are a range State for at least one Appendix I species. 23 Parties (28%), including 13 EU Member States, had strict protection for all CMS Appendix I shark and ray species. An additional 28 Parties had protected some Appendix I species or had partially effective measures in place for all species in their waters.

Table 9. International and regional protected status and management measures for CITES Appendix II-listed pelagic sharks and rays.

Species	UNCLOS Annex I	CMS I	CMS II	CMS MOU	RFMO	RSCAP
Basking shark <i>Cetorhinus maximus</i>	✓	✓	✓	✓	GFCM, NEAFC	Barcelona SPA/BD Protocol, Annex 2. OSPAR List 2008-6.
Whale shark <i>Rhincodon typus</i>	✓	✓	✓	✓	IATTC, IOTC WCPFC	
White shark <i>Carcharodon carcharias</i>	-	-	✓	✓	GFCM	Barcelona SPA/BD Protocol, Annex 2.
Porbeagle shark <i>Lamna nasus</i>	-	-	✓	✓	GFCM, ICCAT NEAFC	Barcelona SPA/BD Protocol, Annex 2. OSPAR List 2008-6.
Oceanic whitetip shark <i>Carcharhinus longimanus</i>	✓	✓	-	✓	IATTC, ICCAT IOTC, WCPFC	
Scalloped Hammerhead <i>Sphyrna lewini</i>	✓	-	✓	✓	GFCM, ICCAT IOTC	Barcelona SPA/BD Protocol, Annex 2.
Great hammerhead <i>Sphyrna mokarran</i>	✓	-	✓	✓	GFCM, ICCAT IOTC	Barcelona SPA/BD Protocol, Annex 2.
Smooth hammerhead <i>Sphyrna zygaena</i>	✓	-	✓	✓	GFCM, ICCAT IOTC	Barcelona SPA/BD Protocol, Annex 2.
Pelagic thresher shark <i>Alopias pelagicus</i>	✓	-	✓	✓	IOTC	
Bigeye thresher shark <i>Alopias superciliosus</i>	✓	-	✓	✓	ICCAT, IOTC	
Common thresher shark <i>Alopias vulpinus</i>	✓	-	✓	✓	ICCAT, IOTC	Barcelona SPA/BD Protocol, Annex 3.
Silky shark <i>Carcharhinus falciformis</i>	✓	-	✓	✓	IATTC, ICCAT WCPFC	
Shortfin mako shark <i>Isurus oxyrinchus</i>	✓	-	✓	✓	GFCM, ICCAT	Barcelona SPA/BD Protocol, Annex 2.
Longfin mako shark <i>Isurus paucus</i>	✓	-	✓	✓		
Reef manta ray <i>Manta (Mobula) alfredi</i>	-	✓	✓	✓	IATTC, IOTC WCPFC	
Oceanic manta ray <i>Manta (Mobula) birostris</i>	-	✓	✓	✓	IATTC, IOTC WCPFC	
Atlantic devil ray <i>Mobula hypostoma</i>	-	✓	✓	✓		
Shortfin devil ray <i>Mobula kuhlii</i>	-	✓	✓	✓	IOTC, WCPFC	
Giant devil ray <i>Mobula mobular</i>	-	✓	✓	✓	GFCM, IOTC WCPFC	Barcelona SPA/BD Protocol, Annex 2.
Smoothtail/Munk's devil ray <i>Mobula munkiana</i>	-	✓	✓	✓		
Chilean/Sicklefin devil ray <i>Mobula tarapacana</i>	-	✓	✓	✓	IATTC, IOTC WCPFC	
Bentfin devil ray <i>Mobula thurstoni</i>	-	✓	✓	✓	IOTC, WCPFC	

6.2 Regional Management

6.2.1 United Nations Environment Programme (UNEP) Regional Seas Programme (UNRSP)

In addition to administering the Secretariats for CITES and CMS, the United Nations Environment Programme (UNEP) coordinates the United Nations Regional Seas Programme (UNRSP). Launched in 1974 to enable a “shared seas” approach to conserving coastal and marine resources, the UNRSP is implemented through 18 Regional Seas Conventions and Action Plans (RSCAPs), with 143 participating countries. RSCAPs provide the legal framework for protecting the oceans and seas at regional level, supported through the RSP Secretariats, Regional Coordinating Units (RCUs) or Regional Activity Centres (RACs). They also serve as a platform to deliver regional conservation activities and outcomes, including those mandated through CITES and CMS, and to progress sustainable development commitments such as the Sustainable Development Goals (SDGs).

Extraction of living and non-living resources is one of four overarching themes for the work of the UNRSP, and a core goal is to work in collaboration with RFMOs (UNEP 2015). Even RSCAPs without an explicit fisheries remit consider its impacts when addressing environmental matters, such as marine and coastal resource management, pollution and biodiversity concerns, recognising fisheries as the most ubiquitous extractive activity affecting the world’s oceans and the most important global threat to marine species. However, some RSCAPs have an advisory remit for fisheries and act as Regional Fisheries Bodies (RFBs) (see next section). The Antarctic Regional Seas Programme, for example, operates under the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR). The Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden (PERSGA) is the coordinating body for the regional seas programme and serves as an RFB.

Annex 4 identifies the RSCAPs that are engaged in the conservation and management of sharks, for example by listing species of concern in their Annexes and/or implementing work programmes for sharks and rays (e.g. Mediterranean, Wider Caribbean, North East Atlantic, Western Indian Ocean) or providing shark fisheries advice and capacity-building (e.g. Red Sea and Gulf of Aden).

The first UNRSP initiative for sharks was elaboration and adoption, in 2003, of an Action Plan for the Conservation of Cartilaginous Fishes (Chondrichthyes) in the Mediterranean Sea. This was led by the **UNEP Mediterranean Sea Regional Activity Centre**, operating under the auspices of the **Barcelona Convention for the Protection of the Marine Environment and Coastal Region of the Mediterranean**. Since its publication, the Contracting Parties to the Barcelona Convention have agreed to list a number of endangered chondrichthyans on the Annexes of the Barcelona Convention Protocol concerning Specially Protected Areas and Biodiversity in the Mediterranean.

Other important examples of RSPs addressing shark and ray conservation include the collaboration between the **South Pacific Regional Environment Programme (SPREP)**, **Secretariat of the Pacific Community** (an RFB), and **Forum Fisheries Agency** (an RFB) to produce and publish, in 2009, guidance for a South Pacific RPOA for Sharks to assist the Pacific Island Countries and Territories in developing conservation and management efforts for chondrichthyans in that region. That work is moving forward, including through a growing number of NPOAs, with the support of a dedicated Shark and Ray Conservation Officer at SPREP.

More recently, the RSP for Eastern Africa, under the **Nairobi Convention for the Protection, Management, and Development of the Marine and Coastal Environment of the Eastern African Region**, has, since 2012, included sharks and rays in the Convention’s programme of work and has been supporting the development of a regional roadmap to prioritize conservation efforts for sharks and rays, as well as to review shark and ray species for possible listing on the Nairobi Convention Protocol for Protected Areas and Wild Fauna and Flora in the East African Region.

In the Caribbean, the Contracting Parties to the **Cartagena Convention for the Protection and Development of the Marine Environment in the Wider Caribbean Region** have recently agreed to list the CITES Appendix I species, the largemouth sawfish, on the Convention's Protocol for Specially Protected Areas and Wildlife, thus providing additional impetus to efforts to recover this Critically Endangered species.

6.2.2 Regional Fishery Bodies

Regional Fishery Bodies (RFBs) are the primary mechanism for cooperative decision-making and implementation of fisheries management by their Contracting and/or Cooperating Non-Contracting Parties (CPCs). Their role is vital for promoting long-term sustainable fisheries at regional and national levels, particularly where international cooperation among countries is required for species conservation and fisheries management of shared stocks. Over 50 RFBs have been established to support the management of marine and freshwater fisheries. Most have a purely advisory mandate; they provide non-binding scientific advice and serve as a forum for capacity-building, technical exchange, development and implementation of coordinated actions and approaches, among many activities. Other RFBs, the Regional Fisheries Management Organizations (RFMOs), are mandated to adopt conservation and management measures (CMMs) that are binding on their members, in addition to non-binding decisions. RFBs have the potential to play an important role in supporting the implementation of CITES for listed marine species, as recognised in operative paragraphs 3, 5, 6 and 10 of CITES Resolution Conf. 12.6 (Rev. CoP18), all directed to Parties (Annex 7).

Originally, RFBs were established to deliver the conservation, management and/or development solely of the fisheries for which they are responsible. Some of the more recently established RFBs have a broader mandate that includes all living marine resources in their geographic area of competence. With the adoption of the FAO Code of Conduct for Responsible Fisheries and development of the Ecosystem Approach to Fisheries, RFBs – and RFMOs – are broadening focus to include the ecosystem effects of fishing, e.g., on vulnerable habitats that may be damaged by certain fishing gears and vulnerable species, such as marine turtles, seabirds, and sharks, that interact with – and suffer mortality in – fishing operations targeting other species.

RFMOs play the main role in facilitating international fisheries management, providing the only realistic means of governing fishing operations on the high seas, and conserving populations that move between the exclusive economic zones (EEZs) or territorial waters of neighbouring States, and/or between EEZs and the high seas. There has been wide recognition in recent years that RFMOs need to be strengthened⁹, particularly by improving their governance and compliance mechanisms, and implementing the principles of ecosystem-based management and the precautionary approach. Some are now also working to strengthen international cooperation, promote transparency, address fishing by non-members, and enhance monitoring, control and surveillance (MCS) measures, including the implementation of mandatory vessel monitoring systems (VMS), the adoption of regional schemes for Port State Measures and the development of IUU vessel lists.

Since adoption of the FAO IPOA-Sharks in 1999, a number of Regional Fishery Bodies (RFBs) have undertaken a range of efforts to advance the conservation and management of sharks, including, in recent years, to support CITES implementation for these species. Annex 3 lists the 32 RFBs of greatest relevance to the implementation of CITES for sharks and indicates whether they have taken or are taking actions on behalf of these species. Of the 14 RFMOs on the list, eight

⁹ <http://www.fao.org/fishery/topic/14908/en>: Strengthening RFBs and their performances in order that fish stocks may be better conserved and managed remains the major challenge facing international fisheries governance. This is reinforced by the overall state of exploitation of marine fishery resources where the situation is more serious for certain fishery resources that are exploited solely or partially in the high seas and, in particular, for straddling stocks and for highly migratory oceanic sharks.

have adopted one or more Conservation and Management Measures (CMM) for CITES-listed sharks and rays, while a total of ten have adopted CMMs for sharks. Table 10 summarises the CMMs that have been adopted for CITES-listed sharks and rays by these RFMOs, but does not provide details of the exemptions (loopholes) that limit the effectiveness of many of these measures.

Table 10. RFMO management status of sharks and rays listed in the CITES Appendices

	CCAMLR	CCBST	GFCM	IATTC	ICCAT	IOTC	NEAFC	WCPFC
<i>Alopias pelagicus</i> Pelagic Thresher Shark		Prohib.				Prohib.		
<i>Alopias superciliosus</i> Bigeye Thresher		Prohib.			Prohib.	Prohib.		
<i>Alopias vulpinus</i> Common Thresher		Prohib.				Prohib.		
<i>Carcharhinus falciformis</i> Silky Shark		Prohib.		*Prohib.	Prohib.			Prohib.
<i>Carcharhinus longimanus</i> Oceanic whitetip		Prohib.		Prohib.	Prohib.	Prohib.		Prohib.
<i>Carcharodon carcharias</i> White Shark			Prohib.					
<i>Cetorhinus maximus</i> Basking Shark			Prohib.				Prohib.	
<i>Isurus oxyrinchus</i> Shortfin Mako Shark			Prohib.		*Live release			
<i>Isurus paucus</i> Longfin Mako								
<i>Lamna nasus</i> Porbeagle		Prohib.	Prohib.		Prohib.		Prohib.	
<i>Rhincodon typus</i> Whale Shark		Prohib.		Prohib.		Prohib.		Prohib.
<i>Sphyrna lewini</i> Scalloped hammerhead		Prohib.	Prohib.	Live release	Prohib.			
<i>Sphyrna mokarran</i> Great hammerhead		Prohib.	Prohib.	Live release	Prohib.			
<i>Sphyrna zygaena</i> Smooth hammerhead		Prohib.	Prohib.	Live release	Prohib.			
Genus <i>Mobula</i> Devil Rays (incl Mantas)		Prohib.	Prohib. (<i>M mobular</i>)	*Prohib.		Prohib.		Prohib.
Family Pristidae Sawfishes			Prohib.					
Family Glaucostegidae Giant guitarfishes, six spp			Prohib. (two spp)					
Family Rhinidae Wedgefishes, ten spp			Prohib. (two spp)					
Generic: Finning prohibited		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Generic: Live release	CM 32-18			Yes	Yes			
Generic: Bycatch mitigation/limits		ERS mitigation		Yes	Yes			Yes
Generic: Target fishing prohibited	CM 32-18				Some spp.			
Generic: Nursery grounds					Yes			
Generic: Apply other trFMO measures		10 CMM alignment						
CM/CMM: Conservation [and Management] Measure. Prohib: prohibited. * exemptions apply. ERS: ecologically-related species.								

10 The CCSBT has an agreed binding Resolution to Align CCSBT's Ecologically Related Species measures with those of other tuna RFMOs. It is annually updated according to relevant adopted 'ERS Measures' which refers to measures relating to ecologically related species in force in the IOTC, WCPFC and ICCAT. It applies to all registered vessels of the Members and Cooperating Non-Members authorised to fish for Southern Bluefin Tuna.

The management of pelagic sharks listed in CITES Appendix II is being addressed in some respects by the five major tuna RFMOs (tRFMOs), which manage pelagic fisheries in 91% of the world's oceans and have the authority (albeit unclear for IOTC and IATTC), if not the explicit responsibility, to manage bycatch of the Ecologically-Related Species (ERS) associated with these fisheries. The most common measures adopted by tRFMOs specific to sharks are a prohibition on finning (the removal of a shark's fins and discarding the carcass at sea), and prohibitions on retention, landing, etc. of a limited number of species. In addition to these CMMs, these RFMOs have established reporting requirements for the catch of some shark and ray species, and in some cases the resulting data is supporting stock assessments and/or ecological risk assessments for these species.

While not specifically considered in this document, many RFBs/RFMOs have adopted non-species specific time/area closures and recommended and mandated gear restrictions. For example, SIOFA, SPRFMO, IOTC, SEAFO, CCAMLR and NEAFC have restricted the use of deep water bottom set gill nets. While these measures would prevent the catch of a broad range of taxa, they would certainly be restricting the catch of shark species and in a number of cases these gear restrictions were put in place to prevent the targeting of deep-water shark species which are particularly susceptible to overexploitation. Similarly, the management plans for Fish Aggregating Devices (FADs) introduced by tRFMOs should reduce the mortality of species such as silky sharks caught in association with tuna purse seine fisheries that use these devices in their operations.

While these efforts represent a degree of progress in addressing overfishing of sharks, it is important to note that it is very difficult to measure what contribution this is making to reducing overfishing for these species or recovering overfished shark species, not least because prohibitions may also reduce data collection opportunities. Lack et al. (2014), while assigning scores to assess the risk of overexploitation of sharks, have considered the direct contribution that different management measures make and provided guidance on how to measure this; this is therefore, a worthwhile resource to consider when looking for management measures to adopt for sharks.

While some RFMOs have made efforts to advise their Members on CITES responsibilities as a result of their catch of listed species (Clarke and IOTC Secretariat 2014, Clarke et al. 2014), there is great scope for an expansion of RFMO efforts to improve the management of CITES-listed sharks that are taken in fisheries under their remit. Most still need to be instructed by their Members to:

- undertake work that would support their Members who are CITES Parties in conducting Non-Detriment Findings (NDFs) for species they catch and land/trade, particularly for shared stocks they catch under the remit of the RFB (see operative paragraph 5, Annex 7);
- adopt management measures if necessary, such as precautionary catch or bycatch limits, for shark species (regardless of their CITES status) to ensure their catch is sustainable;
- adopt traceability systems for their products to ensure their trade is legal; and
- adopt comprehensive management plans to reduce overfishing of these species, or recovery plans for overfished species such as the oceanic whitetip shark.

A recent Joint Tuna RFMO By-catch Working Group meeting (Anon 2019) was the first to promote discussions on the assessment and management of elasmobranchs from a global perspective within the tRFMOs. It developed a list of recommended key areas for future action, covering management, scientific and technical matters, and data. The management recommendations include: "Improve communication and cooperation between CITES and tRFMOs to provide guidance and advice for the CITES listed species caught within the jurisdiction of each tRFMO."

The activities of the advisory RFBs, which contribute to the efforts of RFMOs in key areas such as monitoring, control and surveillance (MCS), information exchange, and scientific advice, may also lead to improved national fisheries governance and harmonized regional measures¹¹.

In all cases, the RFB Members that are CITES Parties first need to request that the RFBs take action in the above areas.

6.2.3 Regional Shark Plans (RPOA) and other regional collaborations related to the FAO IPOA–Sharks

To date, eight Regional Plans of Action (RPOAs) or Guidance for NPOAs and RPOAs have been adopted (Table 12), with several other regional collaborations and RPOA-like processes for sharks and rays initiated. These efforts demonstrate the potential of these existing regional institutions to strengthen collaborations to enhance CITES implementation for sharks and rays.

The Sub-Regional Fisheries Commission (Commission Sous-Régionale des Pêches-CSR), was the first RFB to undertake action planning under the IPOA-Sharks for its seven West African Members. The CSR adopted an RPOA–Sharks in 2001 and, importantly, collaborated with several NGOs, including IUCN and WWF, to secure funds for implementation. The programme achieved numerous advances for shark and ray conservation at national and regional level, including coordinated development of NPOAs and revisions of national fisheries and trade legislation (Diop and Dossa, 2011). Although dedicated funding to support the RPOA has not been consistent since its adoption, the CSR has continued its support, as resources have allowed, through their designated RPOA Coordinator, and the SCR countries have maintained their national Shark Plan focal points. That infrastructure has enabled the CSR to play a leadership role in the region in support of capacity-building for CITES implementation for sharks and rays, and specific conservation and management efforts. A follow-on project to support implementation of the RPOA-Sharks was designed (but not implemented) under the EU-funded ACP Fish II programme in 2010. It focused primarily on conversion of actors in shark supply chains and improvement in harmonization of regulations for shark fisheries across the CSR countries, including to support CITES implementation. The estimated budget was €3.4 million.

The Comisión Técnica Mixta del Frente Marítimo (CTMFM) / Joint Technical Commission for the Argentina-Uruguay Common Fisheries Zone (Zone Común de Pesca-ZCP) published an RPOA-Sharks in 2018. This is the only RPOA thus far produced by an RFMO. The CTMFM incorporated chondrichthyans into their work programme in 2000 and adopted their first chondrichthyan catch limits in 2002. A Chondrichthyans Working Group (Grupo de Trabajo Condriictios-GTC) was established in 2003 to, *inter alia*, formulate scientific advice necessary to establish conservation and management measures for chondrichthyans, evaluate their effectiveness, and make recommendations for harmonization of management and conservation measures for species whose distributions extend beyond the Common Fisheries Zone. The numerous binding conservation and management measures adopted under this RFMO include time-area closures to protect important reproductive areas for chondrichthyans, Total Annual Catch limits (TACs) for certain species; a prohibition on finning, and requirement to return to the sea all live sharks >160cm long; and landing limits for chondrichthyans by fishing set. The GTC has also formulated a cooperative research plan for chondrichthyans in the Common Fisheries Zone and conducted a range of scientific assessments, including Productivity and Sustainability Analyses, Vulnerability Estimates, Indices of abundance; and the first-ever population estimates for sharks and rays in the Southwest Atlantic.

11 <http://www.fao.org/fishery/topic/14908/en>.

Although the CTMFM RPOA refers to CITES and CITES Non-Detriment Findings, the major commercial species under their remit do not currently include CITES-listed species. Nevertheless, their efforts serve as examples of what other RFMOs and RFBs could incorporate into their programmes of work to address conservation and management needs of chondrichthyan species.

Also, in the Americas, the **Comisión Permanente del Pacífico Sur-CPPS** (RFB) adopted an RPOA (PAR Tiburón) in 2010 as a basis for coordinating its Member countries' efforts at a regional level and with RFMOs for shared stocks. One of the expressed purposes of the RPOA and its implementing framework is to enable CPPS to recommend conservation and management measures for chondrichthyans that can be adopted nationally or through other regional bodies. A CPPS Comité Técnico Científico (CTC) PAR Tiburón, comprising representatives from each Member country, assists in coordinating the RPOA. Along similar lines, the **Organización del Sector Pesquero y Acuícola del Istmo Centroamericano (OSPESCA)**'s Central American RPOA is implemented with the assistance of a regional Shark Working Group comprising members from each of the participating countries.

Table 11. Regional Plans of Action (RPOA) or Guidance under the FAO IPOA–Sharks

Organisation	Date	Title	Type	Membership	Reference
BOBLME: Bay of Bengal Large Marine Ecosystem Project / Bay of Bengal IGO	2011	Recommendations for NPOAs and RPOA from the BOBLME Sharks Working Group	Shark Assessment Report & Guidance	Bangladesh, India, Indonesia, Maldives, Malaysia, Myanmar, Sri Lanka, Thailand (BOBLME)	BOBLME 2011
CPPS: Comisión Permanente del Pacífico Sur (South Pacific Commission)	2010	Plan de Acción Regional para la Conservación de tiburones, rayas y quimeras en el Pacífico Sudeste (PAR-CCPS).	Regional Shark Plan	Chile, Colombia, Ecuador, Peru	CPPS 2010
CSRP: Commission Sous-Régionale des Pêches (West Africa)	2001	Plan Sous-Régional d'Action Pour la Conservation et la Gestion des Raies et Requins.	Regional Shark Plan	Cape Verde, Guinea, Guinea-Bissau, Gambia, Mauritania, Senegal, Sierra Leone	SRFC/CSRP 2001, Diop & Dossa 2011
CTMFM: Comisión Técnica Mixta del Frente Marítimo/Joint Fisheries Zone	2018	Plan de Acción Regional para la conservación y pesca sustentable de los chondrictios de la area del Tratado del Rio de la Plata y su Frente Marítimo.	Regional Shark Plan	Argentina, Uruguay	CTMFM 2018
European Union	2009	Community Action Plan for the Conservation and Management of Sharks (CPOA)	Regional Shark Plan	28 EU Member States	CPOA 2009
Barcelona Convention: UNEP Mediterranean Regional Seas Programme	2003	Action Plan for the Conservation of Cartilaginous Fishes (Chondrichthyes) in the Mediterranean Sea.	UNEP Regional Seas Shark Plan	21 Mediterranean States and the European Union	UNEP MAP RAC/SPA. 2003
OSPESCA (Central America)	2011	Plan de Acción Regional para la Ordenación y Conservación de los Tiburones en Centroamérica	Regional Shark Plan / PAR-TIBURON	Belize, Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua, Panama	OSPESCA 2011
South Pacific Island Countries and Territories (PICTs)	2009	Pacific Islands Regional Action Plan for Sharks.	Guidance/ UNEP Regional Seas Shark Plan	21 Members of the Secretariat of the Pacific Community and Western Central Pacific Fisheries Commission	Lack & Meere 2009.

The European Union's Community Shark Plan (CPOA-Sharks), adopted in 2011, integrates a national, regional and global approach to the conservation and management of sharks, because it applies to the vessels and fleets of all of its (currently 28) Member States, wherever they may be fishing. The CPOA has the following three objectives:

1. To broaden the knowledge both on shark fisheries and on shark species and their role in the ecosystem: a) To have reliable and detailed species-specific quantitative and biological data on catches and landings as well as trade data for high and medium priority fisheries; b) To be able to efficiently monitor and assess shark stocks on a species-specific level and develop harvesting strategies in accordance with the principles of biological sustainability and rational long-term economic use; c) To improve and develop frameworks for establishing and coordinating effective consultation involving stakeholders in research, management and educational activities.
2. To ensure that directed fisheries for shark are sustainable and that bycatch of shark resulting from other fisheries are properly regulated: a) To adjust catches and fishing effort to the available resources with particular attention to high priority fisheries and vulnerable or threatened shark stocks; b) To minimize waste and discards from shark catches requiring the retention of sharks from which fins are removed and strengthening control measures.
3. To encourage a coherent approach between internal and external Community policy for sharks.

The EU CPOA is being implemented through the EU Revised Common Fisheries Policy Regulation, adopted in 2014, and its associated fisheries management policies and regulations. These policies and regulations apply to EU fisheries in EU waters and to EU fishing vessels outside of EU waters, including in the waters of third countries and on the High Seas, and waters that form the Area of Competence of RFMOs. The EU CPOA is not only regional but, in view of the Distant Water Fleets of many EU countries (e.g., France, Portugal, Spain) that are among the world's top shark catchers, it also has global reach – and impact.

The EU has adopted a wide array of conservation and management measures for sharks and rays, including gear restrictions and specifications, closed areas and seasons, TACs, minimum observer requirements, and strict recording, reporting, and data management rules. In reviewing the effectiveness of management measures and adapting those, the EU relies heavily on the **International Council for Exploration of the Sea (ICES)**, an RFB whose remit is to provide scientific advice to Northeast Atlantic littoral States and RFMOs for this region, including for the adoption of science-based quotas and prohibited species status for heavily depleted shark stocks.

As with the South Pacific collaboration between SPREP, SPC, and FFA (see section 6.2.1), efforts have been initiated in the Wider Caribbean to bring together several RFBs to collaborate on sharks and rays. These began with the establishment, in 2012, of a Shark Working Group (SWG) under the **West Central Atlantic Fishery Commission-WECAFC** (RFB). The SWG then became part of a larger Joint Working Group on Shark Conservation and Management (JWGSCM), composed of representatives of WECAFC, the **Caribbean Regional Fisheries Mechanism-CRFM** (RFB), **OSPESCA** (RFB), the US Caribbean Fisheries Management Council (CFMC), and Member countries in the region. An agenda item for the JWGSCM's first meeting in 2017 was to develop an RPOA for the 15 countries in the region. While an RPOA has not yet been finalized, the Terms of Reference, adopted and revised by WECAFC, provide for the Shark Working Group to: (a) facilitate sharing of available data and information on shark and ray stocks within the Wider Caribbean Region; (b) provide support to develop NPOAs for Member States and the RPOA; (c) provide technical inputs to support implementation of actions defined in the RPOA; (d) develop and implement a biennial work plan that will be monitored and evaluated; and (e) establish communication between the members of the working group, and between the working group and interested parties, including the private sector.

In Asia, which harbours several global hotspots of shark species biodiversity and extensive and intensive fisheries, and incorporates nine of the top 20 shark-fishing countries (and China), two

RFBs have been particularly active in the past decade in support of the IPOA-Sharks: the **Bay of Bengal Programme Inter-governmental Organisation (BOBP-IGO)** and the **Southeast Asian Fisheries Development Center (SEAFDEC)**. The four Members of BOBP-IGO (Bangladesh, India, Maldives, and Sri Lanka), initiated an RPOA-Sharks effort in 2008. This was taken forward under the auspices of the Bay of Bengal Large Marine Ecosystem Project (BOBLME) project, which incorporated a sharks component that included development of an RPOA Sharks and also involved non-BOBP-IGO member countries, i.e., Indonesia, Malaysia, Myanmar, and Thailand. The BOBLME project was implemented during 2009-2014 with funding from the Global Environment Facility (GEF) and other multi-lateral and bi-lateral donors. A BOBLME Sharks Working Group established following a workshop in 2011 supported the development of NPOAs in several national BOBLME projects, including Bangladesh, Maldives, Malaysia, Myanmar, and Sri Lanka. This collaboration was therefore able to support shark work in a larger number of countries and directly link up with the shark and ray work undertaken by SEAFDEC in the Southeast Asia region. SEAFDEC has provided technical advice, training, and guidance over the years on shark and ray monitoring, identification, and other aspects of shark and ray fisheries management. Most recently, it has supported pilot shark and ray fisheries monitoring projects in several countries to train monitors, collect data, and develop knowledge on their fisheries and the species exploited in them. SEAFDEC has also provided technical and other assistance to the development of NPOAs-Sharks in the region, for example in Myanmar and Malaysia, and (as already noted) the preparation of CITES NDFs.

Following the 2013 CITES CoP16 listings of heavily traded, commercially valuable shark and ray species, the CITES Secretariat and FAO convened three regional workshops in 2014 to review CITES implementation issues and formulate recommendations and priorities for improving the capacities of CITES Management Authorities and their fisheries counterparts to fulfil their CITES obligations for these species. These workshops were held in West Africa (Casablanca Declaration, Anon. 2014a), Asia (Xiamen Declaration, Anon. 2014b) and Africa (Dakar Declaration, Anon. 2014c). Representatives from Regional Fishery Bodies (RFBs) participated in all these workshops, in recognition of the RFBs' essential role in coordinating conservation and management efforts for these commercially exploited marine resources. While there was some variability in outcomes, there was much congruence between the issues identified and recommendations formulated. In recognition of the migratory and straddling stocks nature of CITES-listed species, and the commonality in implementation challenges across countries and regions, these workshops formulated many recommendations for regional collaboration. Others related to national capacities and collaborations for CITES implementation and shark and ray conservation and management.

6.3 National management

6.3.1 Implementation of the FAO IPOA-Sharks – Progress on NPOAs

In 2012, FAO published an assessment of the state of implementation of the 1999 FAO IPOA-Sharks (Fischer et al. 2012), focused on the countries, areas, or territories that individually reported over 1% of global shark catches (see section 5.1 above). Of the 26 such entities (termed 'shark catchers' in this study) that accounted for 84% of the average reported global chondrichthyan catch over the 2000-2009 period, 14 had completed NPOAs; three more (Brazil, India, Peru) had reported drafts or NPOAs in progress; one country (Iran) had reported an NPOA for which no document was provided; and an additional three countries (France, Portugal, Spain) were operating under the European Union CPOA (which is both national and regional in nature).

Almost a decade later, although their relative ranking had changed slightly since 2012, the top 40 shark catching entities were the same (see Table 12). As regards IPOA-Sharks implementation, significant progress has been made. Of the largest shark catchers, three more (India, Peru, Sri Lanka) have now completed and adopted either an NPOA or, in the case of India, a Shark Assessment Report with Guidance for an NPOA, as provided for under the IPOA-Sharks. A fourth country (Pakistan) has elaborated a draft NPOA that is currently under review. Importantly, several

countries (e.g. Argentina, Australia, Indonesia, Malaysia, Uruguay) have revised and updated their NPOAs. Australia has moved to permanently having an NPOA which is updated on an annual basis against the ten objectives for an NPOA as described in the IPOA. It also has an implementation plan. Thailand's 2005 NPOA was revised in 2017 and this revision is awaiting government approval, but neither document is linked from the FAO Database of Measures.

Brazil's 2014 National Action Plan for the Conservation of Endangered Sharks and Marine Rays, published by ICMBio (Ministry of Environment) does not cover commercially-fished species, which fall under different regulations. The broken link from the FAO Database of Measures to a 2011 Proposed Management Plan for Sustainable Use of Elasmobranchs that are Over-exploited or Threatened with Over-Exploitation, published by IBAMA (the Environment Ministry Institute of Environment and Renewable Natural Resources) refers to an earlier draft.

Only two countries remain from FAO's 2012 list of 26 top shark-fishing entities for which there is no readily available evidence of the existence of an NPOA-Sharks or NPOA process: Nigeria and Yemen. Of the additional three countries that now report >1% of world catches, only Ecuador has adopted an NPOA (and also participates in a Regional PoA under the Comisión Permanente del Pacifico Sur-CPPS). Oman has prepared a draft NPOA (2017) but there is no link to this from the FAO database of measures. No NPOA process appears to be underway in Tanzania.

Extending beyond the 26 major shark-fishing countries identified by FAO (2012) and the current analysis of the top 40 shark-catching countries, identifies a number of countries that have not yet adopted NPOAs. Many of these are important for chondrichthyan biodiversity as well as for CITES-listed species. A few States do not appear on lists of the world's major shark fishing countries, although the size of their fleets and/or volume of marine fish catches suggest that they would qualify, if catch data were available to a higher taxonomic level. Examples include Viet Nam and Myanmar, which have very large marine fisheries (ranked globally as the world's 11th and 16th respectively) but had not reported any shark catches to 2017 and, thus, do not yet appear in shark catch rankings (their shark catches are likely lumped with other unidentified species). Additionally, China is ranked in about 50th place for shark catches, based on FAO data, but reports to FAO the world's largest catch of all marine fishes combined. It seems possible, therefore, that that China, Viet Nam and Myanmar should also be considered as major shark-fishing countries.

The above analysis does not attempt to evaluate the extent to which NPOAs, once adopted, have been implemented, nor to assess whether the status of shark stocks and performance of shark fisheries management measures have improved as a result.

Table 12. Responses to the FAO IPOA–Sharks by top 40 shark catching entities (countries, areas or territories), ranked by reported (FAO FishStat) or inferred shark catches.

Country/area/territory	Rank 2000-09	Rank 2008-17	NPOA date	RPOA date
Angola	37	38		
Argentina	5	6	2015 (rev. 2009)	CFTM 2018
Australia	24	23	2014 (V.2)	
Brazil	13	9	Proposed 2011	
Canada	21	36	2007	
Chile	32	39	2006	CPPS CTCPAR 2015
Costa Rica	26	32	2010	PARTCA 2011
Ecuador	40	20	2006	CPPS CTCPAR 2015
France	11	13		EU CPOA 2009
Ghana	39	27		
India	2	3	SAR 2015	
Indonesia	1	1	2015 (V.2)	
Iran (Islamic Rep. of)	18	16		
Japan	10	14	2011 (V.3)	
Korea, Republic of	20	18	2011	
Madagascar	28	29		
Malaysia	9	8	2014 (V.2)	
Mexico	6	4	2004	
Morocco	31	34		
Namibia	36	37	2003	
New Zealand	14	11	2013 (V.2)	
Nigeria	17	10		
Oman	29	21	2017 Draft	
Pakistan	8	15	Draft under review	
Peru	22	17	2014	CPPS CTCPAR 2015
Philippines	30	31	2017 (V.2)	
Portugal	15	12		EU CPOA 2009
Russian Federation	35	33		
Senegal	25	25	2005	CSRP 2001
South Africa	38	35	2013	
Spain	3	2		EU CPOA 2009
Sri Lanka	16	24	2013	
Taiwan Prov. of China	4	7	2004	
Tanzania, United Rep.	34	22		
Thailand	12	26	2005, 2017 (V.2)	
United Kingdom	19	30	2011 (V.2)	EU CPOA 2009
United States of America	7	5	2001	
Uruguay	33	40	2015 (V.2)	CFTM 2018
Venezuela, Boliv Rep.	27	28	2013 (V.2)	
Yemen	23	19		
China	?	?		
Myanmar	?	?		
Viet Nam	?	?		

7 Conclusions

Conservation Status (section 2)

The global conservation status of major commercial shark and ray species is poor and still deteriorating for many species, although there are some early signs of recovery for a few. Poor conservation status is particularly notable for the oceanic pelagic sharks that are the largest source of fins in international trade (over 77% are threatened), and for the shark-like rays from shallow coastal habitats that are among the world's most threatened cartilaginous fishes. These species groups dominate the chondrichthyan fish taxa listed in the CITES Appendices. The Red List status of most CITES Appendix II sharks has recently been reassessed by IUCN, and several are now known to be more seriously threatened than formerly understood. The oceanic whitetip shark, scalloped hammerhead and great hammerhead sharks have been reclassified as Critically Endangered; whale shark, pelagic thresher and smooth hammerhead shark as Endangered.

Threats (section 3)

Excessive fishing mortality is the most widespread threat. Fisheries affect virtually 90% of chondrichthyans and every species listed in the CITES Appendices. Over 90% of CITES-listed species are targeted or retained by at least some fisheries, *versus* only 26% of all the chondrichthyans. Bycatch impacts 83% of species in large-scale fisheries and 52% of those in small-scale fisheries, but all CITES-listed species are a bycatch in a fishery somewhere. Strengthened fisheries management is urgently required to reduce excessive or unsustainable mortality in target and bycatch fisheries. This is equally important for unlisted species as it is for the pelagic shark and ray species listed in the CITES Appendices.

Fisheries and Trade Status (section 4)

Industrial and artisanal fleets supply markets in Asia for processed meat products, shark and ray fins, while fillets of the meat of the same captured sharks is often diverted along separate supply channels to meet demand in growing markets in Europe and South America. Total catches of sharks and rays reported to FAO peaked in 2000, before declining slowly. Most were taken from the Atlantic Ocean and adjacent seas (37%), followed by the Pacific (33%) and Indian Ocean (26%). The largest shark catchers¹² in this and former analyses are Indonesia, India and Spain, followed by Mexico, USA, Argentina, and Taiwan Province of China. The top 40 catchers have remained unchanged since 2000, but these top seven are now reporting a greater proportion of global catches (rising from 48% to 59%). Although the number of catchers reporting more than 1% of the global catch has fallen from 26 to 24 over the past decade, the 24 are now taking 91% of the reported world catch, compared with 85% in earlier years. These figures exclude some major fishing nations that may under-report their shark catches, including China (the world's largest fishing nation), and Viet Nam and Myanmar (which report no sharks despite being among the world's 20 fishing nations).

Shark and ray meat and fin trade volumes and value have declined over the past decade. The top 20 importers of shark meat accounted for 90% of global imports over the past 12 years. Europe and South America are the largest retail markets and importers for shark and ray meat. The top meat exporting countries include Spain, Taiwan, Uruguay, USA, Argentina, Portugal, Japan, Namibia, and Indonesia. The four largest importers of shark fin (Hong Kong SAR, Malaysia, China and Singapore) account for almost 90% of the fin trade. Hong Kong Customs records report trade with an average of 83 nations annually, but the largest fin exporters and re-exporters are Singapore, Taiwan, Spain, Peru, United Arab Emirates, and Indonesia.

¹² The term "shark catchers" refers to countries, territories and other political entities reporting shark catch to FAO.

The taxonomic resolution of catches reported to FAO has improved slightly over the past ten years. In 2017, 62% of global reported chondrichthyan catches were recorded within taxonomic groupings, including 19% under the category 'Sharks, rays, skates etc, nei', and 38% at species level. Records of trade in meat and fins are still mostly not provided at species level. However, genetic analyses of fin trimmings in retail markets identified a very large number of sharks, rays and chimaeras in trade. Four species (three listed in CITES Appendix II) contributed more than 50% of samples analysed, eight additional species contributed >1% each of the global total, and fins from CITES-listed species comprised over 20% of samples.

Management status (section 5)

Resolution Conf. 12.6 (Rev. CoP18) – Conservation and Management of Sharks – identifies the importance of maintaining close collaboration between FAO, Regional Fisheries Management Organisations, Regional Fishery Bodies, the Convention on the Conservation of Migratory Species of Wild Animals and other relevant international organisations to improve coordination and synergies in the implementation of CITES provisions for CITES-listed shark species (Annex 8). It, *inter alia*, encourages Parties to work through the respective mechanisms of these instruments to improve coordination with activities under CITES.

Several of the 18 Regional Seas Conventions and Action Plans (RSCAPs) coordinated through the UN Regional Seas Programme are actively engaged in the conservation and management of sharks (particularly threatened species) or are developing programmes in this area.

Some 32 Regional Fishery Bodies (RFBs) have potential to support the implementation of CITES for chondrichthyans, including 14 Regional Fisheries Management Organisations (RFMOs). Ten RFMOs have adopted one or more Conservation and Management Measures (CMM) for sharks and/or rays, including eight CMMs for CITES-listed species. Most of the latter prohibit the retention of these species and mandate safe release of sharks caught accidentally; some prohibit intentional purse seine sets on whale sharks. Additional non-species-specific time/area closures and gear restrictions enacted under some RFBs are likely also to reduce fishing mortality of shark and ray species. However, one of the biggest potential synergies lies in improved data collection for and management of CITES-listed sharks taken in fisheries under the RFBs' remit. As noted in Res. Conf. 12.6 (Rev. CoP18), this could include making information available to assist Scientific Authorities in the making of Non-Detriment Findings (NDFs) for shared stocks under the remit of the RFB (paragraph 5); recommending and/or adopting precautionary catch limits for CITES-listed shark species, as well as their allocation; adopting traceability systems for their products to ensure their trade is legal; and adopting comprehensive management plans to reduce overfishing, or recovery plans for overfished CITES species such as the oceanic whitetip.

Only one RFMO has adopted a Regional Shark Plan (RPOA) under the framework of the FAO International Plan of Action for the Conservation and Management of Sharks (IPOA–Sharks): the bilateral Comisión Técnica Mixta del Frente Marítimo/Joint Technical Commission of the Maritime Front (CTMFM). The European Union Community Shark Plan (EU POA) operates at regional and global level (for all EU fisheries within and outside EU waters). All other RPOAs and/or guidance for Shark Plans have been developed and adopted by the advisory RFBs, RSCAPs, or other regional advisory bodies.

At national level: significant progress has been made since FAO's 2012 review of the implementation of the FAO IPOA–Sharks by the world's largest shark catchers. Additional large catchers have drafted and/or adopted National Shark Plans (NPOAs) or NPOA Guidance. Several have revised and updated their NPOAs, a few more than once. However, other important fishing countries have still not produced an NPOA or made one publicly available. Among the new top 24 reporting shark catchers, these are: Iran, Nigeria, Oman, Tanzania, and Yemen. China, Myanmar and Vietnam, countries with major fisheries capacity but low or no reported shark catch, have also not elaborated Shark Plans.

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Annex 1. CITES Appendix II and other major traded shark species' Management Risk by unit/stock (Lack et al. 2014), countries of origin, major fishery types, primary uses in trade and availability of data

Species	Risk of over-exploitation	RFMO Prohibitions	Range and catching countries (FAO, 2018)	Major fishery types	Primary uses and consumer markets	Catch and trade data availability
Pelagic thresher shark, <i>Alopias pelagicus</i>	IOTC: High WCPFC: High	ICCAT members commit to no directed fishery for any <i>Alopias</i> species (BYC 09-07; 2009). IOTC prohibits retention of thresher sharks in commercial fleets and by recreational fishers (Res 12/09; 2012).	<u>Distribution</u> : Indo-Pacific Caught by: SEP*: Ecuador	Bycatch in pelagic longline tuna fisheries and some smaller shark fisheries in the Gulf of California, Red Sea and SE Asia. Bycatch in Spanish Swordfish longline fleet in the Indian Ocean. Caught in longline fisheries in Indonesia and SE Asia. Inshore coastal gillnets, longlines and offshore (not oceanic) longline and gillnets.	Utilized for food, liver oil for vitamin extraction, hides for leather, and fins for shark-fin soup. Most commonly traded as fins. Threshers were 10 th (Field et al. 2017) and 12 th most common family traded for fins on the Hong Kong market (Cardenosa et al. 2017).	Catch and fishing effort data is to be reported by members of the following RFMOs: - IOTC, - WCPFC (by gear type, including available historical data).
Bigeye thresher shark, <i>Alopias superciliosus</i>	CCSBT: High IATTC: High ICCAT: High IOTC: High WCPFC: High GFCM: High	ICCAT prohibits retention and landings of Bigeye thresher, and no directed fishery for any <i>Alopias</i> species (BYC 09-07; 2009). IOTC prohibits retention of thresher sharks in commercial fleets and by recreational fishers (Res 12/09; 2012).	<u>Distribution</u> : Circumglobal Caught by: ECA: Portugal, Spain NEA: Portugal, Spain SEA: Portugal SWA: Brazil, Portugal WCA: Mexico, Spain, Venezuela MBS: Spain ECP: USA SEP: Ecuador, Portugal, Spain SWP: New Zealand	Pelagic longline fisheries in most areas: artisanal trammel and gillnet fisheries in the Mediterranean; longline and gillnet in SW Atlantic; bycatch of the purse seine fishery operating in the Eastern Pacific Ocean.	Utilized for food, liver oil for vitamin extraction, hides for leather, fins for sharkfin soup. Most commonly traded as fins. Threshers were the 10 th (Field et al. 2017) and 12 th most common family traded for fins on the Hong Kong market (Cardenosa et al. 2017).	Catch and fishing effort data is to be reported by members of the following RFMOs: - ICCAT (must also include size frequencies), - IOTC, - WCPFC (by gear type and including historical data) and - GFCM (including gear type and discards). - No data collected by IATTC. Trade data available from CITES Trade Database: 2017 - present
Common thresher shark, <i>Alopias vulpinus</i>	CCSBT: High IATTC: High ICCAT: High IOTC: High WCPFC: High GFCM: High Spain: High	ICCAT: no directed fishery for any <i>Alopias</i> species (BYC 09-07). IOTC prohibits retention of thresher sharks in commercial fleets and by recreational fishers (Res 12/09; 2012).	<u>Distribution</u> : Circumglobal Caught by: ECA: Korea, R. NEA: France NWA: USA SEA: South Africa SWA: Uruguay, Portugal EIO: Portugal	Caught by offshore longline and pelagic gillnet fisheries; also fished with anchored bottom and surface gillnets, and is a bycatch of other gear including bottom trawls and fish traps.	Utilized for food, liver oil for vitamin extraction, hides for leather, and fins for shark-fin soup. Most commonly traded as fins. Threshers were the 10 th (Field et al. 2017) and 12 th most common family traded for fins on the Hong	Catch and fishing effort data is to be reported by members of the following RFMOs: - ICCAT (must also include size frequencies), - IOTC, - WCPFC (by gear type and including historical data) and - GFCM (including gear type and discards). - No data collected by IATTC.

Annex 1. CITES Appendix II and other major traded shark species' Management Risk (continued)

Species	Risk of over-exploitation	RFMO Prohibitions	Range and catching countries (FAO, 2018)	Major fishery types	Primary uses and consumer markets	Catch and trade data availability
Silky shark, <i>Carcharhinus falciformis</i>	ICCAT: High IATTC: High IOTC: High WCPFC: High	IATTC prohibits retention by purse seiners (Res C-19-04; 2019). ICCAT prohibits retention (BYC 11-08; 2011). WCPFC prohibits retention, landing and sale; requires live release (2019/04).	WIO: Portugal, France MBS: France, Italy SWP: New Zealand SEP: Spain ECP: USA; NEP: USA <u>Distribution:</u> Circumglobal <u>Caught by:</u> ECA: Portugal, Spain, Taiwan, Togo NEA: USA SEA: Taiwan SWA: Brazil, Portugal, Taiwan WCA: Costa Rica, Spain, USA EIO: Sri Lanka, Taiwan WIO: Iran, Mozambique, Portugal, Taiwan, Tanzania ECP: Costa Rica, Guatemala, Spain, Taiwan SEP: Ecuador WCP: Fiji, Taiwan, Vanuatu	Fished either directly or as a bycatch throughout its range. It is taken in coastal longline fisheries, oceanic purse seine fisheries on drifting FADs (fish aggregating devices) targeting tuna, swordfish and other billfish around the world, and by coastal artisanal fisheries. Incidental catch often retained for meat and fins.	Utilized for meat and fins. Considered to be the second most commonly traded species in the fin trade (Fields et al. 2017; Cardenosa et al. 2017).	Trade data available from CITES Trade Database: 2017 - present
Oceanic whitetip shark, <i>Carcharhinus longimanus</i>	CCSBT: High IATTC: High ICATT: High IOTC: High WCPFC: High	IATTC prohibits retention – live release required (IATTC 11-10; 2011). ICCAT prohibits retention – release whether alive or dead (BYC 10 – 07; 2010). IOTC prohibits retention (Res 13/6; 2013). WCPFC prohibits retention, landing and sale; requires	<u>Distribution:</u> Epipelagic tropical and subtropical waters. <u>Caught by:</u> ECA: Portugal SWA: Brazil, Portugal EIO: China, Sri Lanka WIO: China, Iran, Maldives, Mozambique, Portugal, Tanzania ECP: China, Taiwan SEP: China, Ecuador SWP: China WCP: China, Fiji, Taiwan	Bycatch of pelagic longline, pelagic gillnets, purse seine, handlines, and occasionally pelagic and even bottom trawls. Mostly taken in tuna and swordfish fisheries. Predominant gear appears to vary by area, e.g. catch of oceanic whitetip by longline in the WCPO is higher than in other oceans due to fishing operations concentrated in equatorial regions.	Primarily traded as highly valuable fins. Meat may be consumed locally if retained. Ranked the 7th most commonly traded species in the fin trade (Fields et al. 2017).	Landings data is to be collected by members of the following RFMOs: - CCSBT: Members are required to report under the reporting requirements of ICCAT, IOTC and WCPFC. Fishing effort data for fisheries in which oceanic whitetip is taken as bycatch are collected. - IATTC: Requires reporting of discards and releases with indication of life status. - ICCAT: Requires reporting for pelagic sharks including oceanic whitetip of catch and effort statistics. - IOTC: Mandated collection of catch and effort data for oceanic whitetip taken by longline, purse seine and gillnet gear. Res.

Annex 1. CITES Appendix II and other major traded shark species' Management Risk (continued)

Species	Risk of over-exploitation	RFMO Prohibitions	Range and catching countries (FAO, 2018)	Major fishery types	Primary uses and consumer markets	Catch and trade data availability
Basking shark, <i>Cetorhinus maximus</i>	ICCAT: High IATTC: High NEAFC: High GFCM: High New Zealand: Medium	NEAFC: no directed fishing for basking shark (Rec 8:2016; 2016).	Distribution: Coastal-pelagic in warm-temperate waters Caught by: NEA: France, Norway, Portugal MBS: Spain SWP: New Zealand	Targeted using entangling nets and harpoons and bycatch in gill nets. Sometimes landed and sold after becoming entangled in set nets or pot lines, or caught in trawls. Bycatch is rarely reported. Exceptions are accidental catches by salmon and cod set nets and deep-water trawls in Newfoundland, and in deep-water fisheries off New Zealand.	Primarily traded as fins.	2013/03 requires shark discards be recorded by species in weight or number for all gears. - WCPFC: Requires data on annual catch (retained and discarded) and fishing effort statistics by gear type for the species. CMM 2019-4 requires discards and life status of discards to be recorded. Trade data available from CITES Trade Database: 2013 - present
White shark, <i>Carcharodon carcharias</i>	CCSBT: High IATTC: High ICCAT: High IOTC: High WCPFC: High GFCM: High USA: High	Prohibited species in Mediterranean (GFCM 42/2018/2)	Distribution: Coastal amphitemperate. Caught by: ECA: Morocco, Senegal ECP: USA	Targeted in commercial and sports fisheries for jaws, fins, game records and aquarium display; protective beach meshing. Incidental catch in longlines, hook-and-line, fixed bottom gillnets, fish traps, herring weirs, trammel nets, harpoons, bottom and pelagic trawls, and purse seine gear.	Teeth, jaws and fins.	Landings and effort data must be collected by the following RFMOs and countries: - ICCAT (including size frequencies), - IOTC - WCPFC - GFCM (to species level where possible, including gear type and discards) - USA: Landings data required by species. Trade data available from CITES Trade Database: 2002 - present
Shortfin mako	CCSBT: High	ICCAT's binding	Distribution: Circumglobal	Bycatch in tuna and billfish	Valued for its meat as	Landings and effort data is to be collected

Annex 1. CITES Appendix II and other major traded shark species' Management Risk (continued)

Species	Risk of over-exploitation	RFMO Prohibitions	Range and catching countries (FAO, 2018)	Major fishery types	Primary uses and consumer markets	Catch and trade data availability
shark, Isurus oxyrinchus	IATTC: High ICCAT: Medium IOTC: High WCPFC: High New Zealand: Medium	recommendation for the North Atlantic stock mandates live release with some exemptions (ICCAT BYC 19-06; 2019). GFCM prohibits the retention of shortfin mako (36/2012/3).	Caught by: ECA: Belize, Cote d'Ivoire, China, Morocco, Portugal, Senegal, Spain, Taiwan, Togo, UK NEA: France, Portugal, Spain, UK NWA: France, Portugal, Spain, UK SEA: China, Namibia, Portugal, South Africa, Spain, Taiwan, UK SWA: Belize, Brazil, China, Portugal, Spain, Taiwan, Uruguay WCA: Belize, Mexico, Panama, Portugal, Spain, Taiwan, Trinidad and Tobago, USA, Venezuela EIO: China, Guinea, Portugal, Spain, Sri Lanka, Taiwan, UK WIO: Belize, China, France, Guinea, Iran, Mozambique, Portugal, Seychelles, South Africa, Spain, Taiwan, Tanzania, UK MBS: Libya, Spain ECP: China, Costa Rica, French Polynesia, Portugal, Spain, Taiwan, USA SEP: Chile, China, Ecuador, Portugal, Spain, Uruguay SWP: China, New Zealand, Portugal, Spain WCP: China, Fiji, New Caledonia, Taiwan, Vanuatu	longline and driftnet fisheries, particularly in high-seas fisheries, and is an important coastal recreational species.	well as its fins and skin. Oil is extracted for vitamins and fins for shark-fin soup. Jaws and teeth are also sold as ornaments and trophies. Was ranked as the 5 th most common species in the fin trade in Hong Kong (Fields et al. 2017).	by members of the following RFMOs: - ICCAT - IOTC - WCPFC
Longfin mako	CCSBT: High		<u>Distribution</u> : Worldwide in	Caught as bycatch in tropical	Utilized fresh, frozen,	Landings and effort data are to be collected

Annex 1. CITES Appendix II and other major traded shark species' Management Risk (continued)

Species	Risk of over-exploitation	RFMO Prohibitions	Range and catching countries (FAO, 2018)	Major fishery types	Primary uses and consumer markets	Catch and trade data availability
shark, Isurus paucus	IATTC: High ICCAT: High IOTC: High WCPFC: High		temperate and tropical waters Caught by: ECP: Portugal, Spain NWA: Spain, USA SWA: Portugal, Spain WCA: Spain, Trinidad and Tobago, Venezuela	pelagic longline fisheries for tuna, swordfish and sharks and in other oceanic fisheries, which operate throughout its range.	and dried or salted for human consumption; meat (lower quality), fins (adult high value), jaws (highly prized), skin, cartilage (Compagno, 1984). Fins higher value than meat: enter international trade (Reardon et al. 2006).	by members of the following RFMOs: - ICCAT (including size frequencies) - IOTC - WCPFC
Porbeagle shark, Lamna nasus	CCAMMLR: High CCSBT: High GFCM: High IATTC: High ICCAT: High IOTC: High NAFO: High NEAFC: High WCPFC: High EU: High Canada: High New Zealand: Medium	ICCAT requires live release (ICCAT BYC 15-06; 2015). NEAFC prohibits directed fishing, requires live release of bycatch (Rec 7:2020). Prohibited in Mediterranean (GFCM 42/2018/2)	<u>Distribution</u> : Circumglobal in temperate waters of the southern hemisphere Caught by: ECA: Portugal, Spain NEA: Faroe Islands, France, Norway NWA: Canada, Spain SEA: Spain SWA: Uruguay SWP: New Zealand	Targeted mainly by longline and taken as bycatch mainly in pelagic longline fisheries but also in midwater and bottom trawling, demersal longline and gillnets.	Primarily utilised and traded as meat.	Landings and effort data required to be collected by the following RFMO members and countries: - CCAMMLR - GFCM (incl. bycatch, release, discards) - ICCAT (including size frequencies) - IOTC - NEAFC (targeting prohibited; all bycatch must be returned to sea; all retained and discarded specimens reported by weight) - WCPFC (porbeagle catch taken south of 20 degrees South must be reported) - Canada - New Zealand (only catch data) Trade data available from CITES Trade Database: 2012 - present
Whale shark, Rhincodon typus	Risk not assessed	IATTC & IOTC: prohibit intentional purse seine sets on whale sharks, require safe release of accidentally encircled whale sharks (IATTC Res C.2019-06; IOTC 2013/05).	<u>Distribution</u> : Circumglobal in tropical and warm-temperate seas	Briefly targeted in small-scale fisheries; may be encircled in tuna purse-seine nets.	Was primarily utilised for meat; also liver oil, fins, and gills.	Trade data available from CITES Trade Database: 2004 - present

Annex 1. CITES Appendix II and other major traded shark species' Management Risk (continued)

Species	Risk of over-exploitation	RFMO Prohibitions	Range and catching countries (FAO, 2018)	Major fishery types	Primary uses and consumer markets	Catch and trade data availability
Scalloped Hammerhead, <i>Sphyrna lewini</i>	IATTC: High ICCAT: High IOTC: High NAFO: High WCPFC: High	WCPFC prohibits retention; sets on tuna associated with whale shark if sighted prior to set (2019/04). Retention of all hammerhead species (except for <i>Sphyrna tiburo</i>) prohibited by ICCAT and GFCM (ICCAT BYC 10-08, 2010; GFCM 42/2018/2)	<u>Distribution</u> : Circumglobal in coastal warm temperate and tropical seas. Caught by: ECA: Mauritania SWA: Brazil WCA: USA, Venezuela SEP: Ecuador	Taken as target and bycatch by trawls, purse seines, gillnets, fixed bottom longlines, pelagic longlines and inshore artisanal fisheries.	Primarily traded as fins. Was ranked as the 3 rd (Fields et al. 2017) and 4 th (Cardenosa et al. 2017) most common species in the fin trade in Hong Kong.	Landings and effort data required to be collected by members of the following: - ICCAT: Retention of all hammerhead species prohibited; number of discards and releases to be recorded with life status - IOTC: For fisheries using longline and gillnet gear but not for purse-seiners Trade data available from CITES Trade Database: 2012 - present
Great hammerhead, <i>Sphyrna mokarran</i>	Risk not assessed.	Retention of all hammerhead species (except for <i>S. tiburo</i>) prohibited by ICCAT and GFCM (ICCAT BYC 10-08, 2010; GFCM 42/2018/2)	<u>Distribution</u> : Coastal tropical and warm temperate waters worldwide Caught by: WCA: USA, Venezuela	Taken by target and as bycatch in fisheries using longlines, fixed bottom nets, hook-and-line, and possibly with pelagic and bottom trawls.	Primarily traded as fins. Ranked the 7 th most commonly traded species in the fin trade (joint rank with oceanic white-tip; Fields et al. 2017).	Trade data available from CITES Trade Database: 2014 - present
Smooth hammerhead, <i>Sphyrna zygaena</i>	CCSBT: High IATTC: High ICCAT: High IOTC: High WCPFC: High GFCM: High	Retention of all hammerhead species (except for <i>S. tiburo</i>) prohibited by ICCAT and GFCM (ICCAT BYC 10-08, 2010; GFCM 42/2018/2)	<u>Distribution</u> : Widespread in temperate and tropical seas. Caught by: ECA: Morocco, Portugal, Spain NEA: Portugal, Spain WIO: Iran SEP: Ecuador SWP: New Zealand	Caught in a variety of fisheries including artisanal and small-scale commercial fisheries, bottom longlines as well as offshore pelagic longlines and gillnets.	Utilized for fins, skin, liver-oil, cartilage, teeth. Ranked the 4 th most commonly traded species in the fin trade (Fields et al. 2017).	Landings and effort data required to be collected by members of the following RFMOs: - IATTC (including gear type) - ICCAT: Retention of all hammerhead species prohibited; number of discards and releases to be recorded with life status - IOTC Trade data available from CITES Trade Database: 2014 - present
Manta rays, <i>Mobula</i> (Manta), two	Risk not assessed	IATTC, IOTC, WCPFC prohibit targeting, retention	<u>Distribution</u> : Circumglobal Caught by: (categorised under 'Mantas, devil rays nei'):	Caught as bycatch and targeted throughout the Atlantic, Pacific, and Indian Oceans with a variety	Utilized for meat, medicine and branchial filter plates (gill rakers)	Currently catches are not recorded by countries submitting to the FAO at species level, except for the Giant manta, but in

Annex 1. CITES Appendix II and other major traded shark species' Management Risk (continued)

Species	Risk of over-exploitation	RFMO Prohibitions	Range and catching countries (FAO, 2018)	Major fishery types	Primary uses and consumer markets	Catch and trade data availability
species		and sale any mobulids (IATTC 2015-04; IOTC 2019-03; WCPFC 2019-05)	EIO: Indonesia, Sri Lanka WCP: Indonesia	of gear types including harpooning, netting and trawling. Bycatch in purse seine, gillnet, and trawl fisheries.	from Mobula. Used for traditional Chinese medicine.	groupings of 'Mantas, devil rays nei' (average catch of 4471 tonnes/year; increasing trend) and 'Rays, stingrays, mantas nei' (127 220 tons/year; increasing trend, FAO 2019).
Mobulid/devil rays, Mobula, nine species	Risk not assessed	IATTC, IOTC, WCPFC prohibit targeting, retention and sale (IATTC 2015-04; IOTC 2019-03; WCPFC 2019-05) GFCM prohibits M. mobular (42/2018/2)	Distribution: Worldwide distributions in tropical and temperate waters of Pacific, Atlantic and Indian Oceans. Caught by: (categorised under 'Mantas, devil rays nei'): EIO: Indonesia, Sri Lanka WCP: Indonesia	Caught in commercial and artisanal, target and bycatch, fisheries throughout their global range in the Atlantic, Pacific and Indian Oceans.	Primarily traded for their gill plates. Meat, cartilage and skins is also utilised but not as important as gill plates.	
Blue shark, Prionace glauca	CCSBT: High IATTC: High ICCAT: Medium IOTC: High WCPFC: High	ICCAT TACs in North Atlantic (BYC 2019-07) and South Atlantic (BYC 2019-08)	<u>Distribution</u> : wide ranging, found in tropical, subtropical and temperate waters. Reported as <u>landed</u> by the following top countries: AO and adjacent seas: Spain, Portugal, Brazil, Taiwan (Prov. China), Namibia. IO: Indonesia, Spain, Taiwan Province of China. PO: Mexico, Spain.	Rarely targeted by commercial fisheries, but a major bycatch of longline and driftnet fisheries, particularly on high-seas.	Primarily traded as fins. Was the most abundant in international trade – ranked number 1 most common species found in the fin trade market in Hong Kong, Fields et al. 2017; Cardenosa et al. 2017. Meat popular in Spanish markets, and in Asia processed as surimi.	Catch data recorded at species level in the FAO FishStat database. ICCAT has a non-binding resolution for catch recording and data submission. IOTC Res18/02 adopted in 2018 requires catch monitoring, recording and reporting.

*AO: Atlantic Ocean, NWA: Northwest Atlantic, WCA: Western Central Atlantic, ECA: Eastern Central Atlantic, SWA: Southwest Atlantic, SEA: Southeast Atlantic; IO: Indian Ocean, WIO: Western Indian Ocean, EIO: Eastern Indian Ocean; PO: Pacific Ocean, NWP: Northwest Pacific, NEP: Northeast Pacific, WCP: Western Central Pacific, ECP: Eastern Central Pacific, SWP: Southwest Pacific, SEP: Southeast Pacific; MBS: Mediterranean and Black Sea.

Annex 2. Regional Fisheries Management Organizations (RFMOs) with current Conservation and Management Measures for sharks, rays and chimaeras

RFMO	CMM Ref	Date	Title	Species	Summary
Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR)					
CCAMLR	CM 33-02	2020	Limitation of by-catch in Statistical Division 58.5.2 in the 2017/18 season	Somniosus spp., skates and rays.	If by-catch in a haul is equal to, or greater than, 2t of <i>Somniosus</i> spp., or 2t of skates and rays, then the fishing vessel shall not use that fishing method within 5 n miles of the location where the by-catch limit is exceeded for at least five days.
CCAMLR	CM 33-03	2020	Limitation of by-catch in new and exploratory fisheries in current season	Skates and rays	Bycatch limit for skates and rays: 5% of the catch limit of <i>Dissostichus</i> spp.
CCAMLR	CM 32-18	2006	Conservation of Sharks	All sharks	Prohibits directed fishing on shark species prohibited. Live release of shark by-catch as far as possible.
Commission for the Conservation of Southern Bluefin Tuna (CCSBT)					
CCSBT		2018	Resolution to Align CCSBT's Ecologically Related Species measures with those of other tuna RFMOs	sea birds, sea turtles, sharks, cetaceans	Binding ERS measure. Requires CCSBT Members to follow the ERS measures of other relevant tuna RFMOs
CCSBT		2011	Recommendation to Mitigate the Impact on Ecologically Related Species of Fishing for Southern Bluefin Tuna	sea birds, sea turtles, sharks	CPCs to implement the IPOA-Sharks and comply with all current binding and recommendatory measures adopted by IOTC, ICCAT, WCPFC. Reporting, data collection etc.
General Fisheries Commission for the Mediterranean (GFCM)					
GFCM	42/2018/2	2018	On fisheries management measures for the conservation of sharks and rays in the GFCM area, amending Recommendation GFCM/36/2012/3	24 species of sharks and rays, Shark finning	Finning, beheading and skinning of specimens before landing prohibited. Trawl nets prohibited within 3 n miles or shallower than 50 m. Prohibited to retain on board, transship, land, transfer, store, sell elasmobranchs listed in SPA/BD Barcelona Convention Protocol Annex II (endangered or threatened spp).
GFCM	39/2015/4	2015	On management measures for piked dogfish in the Black Sea	Spiny dogfish <i>Squalus acanthias</i>	Will develop management measures to achieve MSY no later than 2020. CPCs to adopt these and to protect a % of trawl grounds. Evaluate effectiveness by 2018.
Inter-American Tropical Tuna Commission (IATTC)					
IATTC	Res. C-19-06	2019	Conservation of whale sharks	Whale shark	Prohibits intentional net sets on whale sharks. Requires safe release and reporting of accidental sets.
IATTC	Res. C-19-04	2019	Conservation measures for shark species, with special emphasis on silky shark for years 2020 and 2021	Silky sharks <i>Carcharhinus falciformis</i>	Prohibition on retention by purse seiners. Limit of 20% bycatch on longlines not licenced to take sharks. If sharks targeted, catch of silky sharks <100 cm must not exceed 20% of all silky sharks. Reduced use of wire leaders if % exceeded. Small vessels exempted. No fishing in pupping areas. Data requirements.
IATTC	Res. C-16-04	2016	Amendment to Resolution C-05-03 on the Conservation of sharks caught in association with fisheries in the E. Pacific	All sharks	Research into shark species, gear selectivity, improved handling practices to maximise post-release survival.

Annex 2. Regional Fisheries Management Organizations (RFMOs) with Conservation and Management Measures for sharks, rays and chimaeras (continued)

RFMO	CMM Ref	Date	Title	Species	Summary
IATTC	Res. C-16-05	2016	On the management of shark species	All sharks, specifically silky, hammerheads, whale sharks	Data collection and reporting. Safe release requirements.
IATTC	IATTC 15-04	2015	On the conservation of mobulid rays caught in association with fisheries in the IATTC convention area	Mantas and mobulas	Retention prohibited. Live release following guidelines required. Data recording and reporting. Artisanal fleets exempted.
IATTC	IATTC 11-10	2011	On the conservation of Oceanic whitetip sharks caught in association with fisheries in the Antigua Convention Area	Oceanic whitetip sharks	Retention prohibited. Live release required. Data recording and reporting.
IATTC	IATTC 05-03	2005	On the Conservation of sharks caught in association with fisheries in the Eastern Pacific	All sharks	CPCs should establish and implement NPOAs. Full utilisation. No finning, with a 5% fin:carcass ratio. Live release, research, data requirements.
International Commission for the Conservation of Atlantic Tunas (ICCAT)					
ICCAT	BYC 19-08	2019	Management measures for conservation of South Atlantic blue shark caught in association with ICCAT fisheries	Blue shark	Annual TAC established. Allocation to be decided by 2021.
ICCAT	BYC 19-07	2019	Amending Rec 16-12 on management measures for the conservation of the North Atlantic blue shark caught in association with ICCAT fisheries	Blue shark	Annual TAC established. Catch limits for EU, Japan, Morocco; other CPCs to maintain at recent levels. To be reviewed in 2021.
ICCAT	BYC 19-06	2019	On the conservation of North Atlantic shortfin mako caught in association with ICCAT fisheries.	Shortfin mako	Prompt live release, with exemptions (when dead), data collection and reporting, maintain historical catch levels. Research.
ICCAT	BYC 18-06	2018	On improvement of compliance review of conservation and management measures regarding sharks caught in association with ICCAT fisheries.	All sharks	Non-binding. Reporting on implementation and compliance with shark conservation and management measures. Finning, data reporting, porbeagle, mako, bigeye thresher, oceanic whitetip, hammerheads, silky sharks
ICCAT	BYC 15-06	2015	On Porbeagle caught in association with ICCAT fisheries.	Porbeagle	Binding. Live release. Data collection, research.
ICCAT	BYC 14-06	2014	On Shortfin Mako Caught in Association with ICCAT Fisheries.	Shortfin Mako	Binding. Improve catch recording and reporting. Research.
ICCAT	BYC 13-10	2013	On Biological Sampling of Prohibited Shark Species by Scientific Observers.	Bigeye thresher (09-07), Oceanic whitetip (10-07), Hammerhead (10-08), Silky (11-08).	Binding. Only use dead specimens. Permits required. Reporting requirements.

Annex 2. Regional Fisheries Management Organizations (RFMOs) with Conservation and Management Measures for sharks, rays and chimaeras (continued)

RFMO	CMM Ref	Date	Title	Species	Summary
ICCAT	BYC 12-05	2012	On Compliance with Existing Measures on Shark Conservation and Management.	bigeye thresher (09-07), oceanic whitetip (10-07), hammerhead (10-08), silky (11-08).	Binding. All CPCs submit to the ICCAT Secretariat details of their implementation of and compliance with shark conservation and management measures [Recs. 04-10, 07-06, 09-07, 10-08, 10-07, 11-08 and 11-15].
ICCAT	BYC 11-08	2011	On the Conservation of Silky Sharks Caught in Association with ICCAT Fisheries.	Silky shark	Binding. Prohibit retention. Release whether dead or alive. Increase survival rates. Collect and report data.
ICCAT	BYC 10-08	2010	On hammerhead sharks (Family Sphyrnidae) caught in association with fisheries managed by ICCAT.	Hammerhead sharks	Binding. Prohibit retention all hammerhead sharks (except for <i>Sphyrna tiburo</i>). Release/discard, alive or dead. Collect and report data, including condition on release. Research into nursery grounds. Capacity-building
ICCAT	BYC 10-06	2010	On Atlantic shortfin mako sharks caught in association with ICCAT fisheries	Shortfin mako	Binding. CPCs to report on implementation/ compliance with Recs 04-10, 05-05, 07-06; steps to improve data collection. No data reporting by CPCs and species is prohibited for that CPC. SCRS stock assessment in 2012 and advice on annual catch levels to support MSY.
ICCAT	BYC 10-07	2010	On the Conservation of Oceanic Whitetip Shark Caught in Association with Fisheries in the ICCAT Convention Area	Oceanic whitetip shark	Binding. Prohibit retention. Release whether dead or alive. Collect and report data, including condition on release.
ICCAT	BYC 09-07	2009	On the Conservation of Thresher Sharks Caught in Association with Fisheries in the ICCAT Convention Area	Thresher Sharks	Binding. Prohibits retention and landings of bigeye thresher (<i>Alopias superciliosus</i>). Mx small-scale coastal fishery exempted. No directed fishery for any <i>Alopias</i> spp. Collect and report data and condition on release. Implement research to identify and protect nursery areas.
ICCAT	BYC 07-06	2007	Supplemental Recommendation by ICCAT Concerning Sharks	Porbeagle, shortfin mako.	Binding. Data reporting. Reduce fishing mortality in fisheries targeting porbeagle (<i>Lamna nasus</i>) and North Atlantic shortfin mako sharks. Research. Identify nursery areas. Porbeagle stock assessment by 2009.
ICCAT	BYC 04-10	2004	Concerning the Conservation of Sharks Caught in Association with Fisheries Managed by ICCAT.	All sharks	Binding. Finning prohibition (5% fin:carcass ratio). Data collection. Live release. Research into nursery areas & selective fishing gears. Stock assessments in 2005 & by 2007.
ICCAT	BYC 03-10	2003	Resolution by ICCAT on the Shark Fishery	All sharks	Non-binding. CPCs to provide data on catches, gear, landings, trade. Implement NPOAs
ICCAT	BYC 95-02	1995	On Cooperation with FAO With Regard to Study on the Status of Stocks and By-Catches of Sharks.	All sharks	Non-binding. FAO will be the focal point for data collection and coordinate RFMOs. CPCs provide data to and cooperate with FAO.
Indian Ocean Tuna Commission (IOTC)					
IOTC	Res. 19/03	2019	On the Conservation of Mobulid Rays Caught in Association with Fisheries in the IOTC Area of Competence	All mobulid rays	Binding. Prohibits targeting, retention, landing; requires implementation of handling procedures & live release and data reporting. Derogations for subsistence fishers/ consumption, until 2022 for artisanal fishers. Bycatch may be consumed locally. Sampling plans required for artisanal bycatch.

Annex 2. Regional Fisheries Management Organizations (RFMOs) with Conservation and Management Measures for sharks, rays and chimaeras (continued)

RFMO	CMM Ref	Date	Title	Species	Summary
IOTC	Res. 19/02	2019	Resolution 18.08 on FADs updated	Mainly silky sharks	
IOTC	Res. 18/02	2018	Management measures for the conservation of Blue shark caught in association with IOTC Fisheries.	Blue shark	Catch monitoring, recording and reporting. Scientific research. There should be a stock assessment in 2021 when management options will be considered.
IOTC	Res. 18/04	2018	On BIOFAD Experimental project	Mainly silky sharks	Aims to reduce impact and amount of synthetic marine debris
IOTC	Res. 18/06	2018	On Establishing a Programme for Transshipment by Large-Scale Fishing Vessels	All species taken by large-scale tuna longliners	Establishes monitoring at sea, register of vessels authorised to receive transshipments at sea, observer and reporting requirements
IOTC	Res. 18/08	2018	Procedures on a fish aggregating devices (FADs) management plan, including a limitation on the number of FADs, more detailed specifications of catch reporting from FAD sets, and the development of improved FAD designs to reduce the incidence of entanglement of non-target spp	Mainly silky sharks	Procedures on a fish aggregating device (FAD) management plan, including specifications of catch reporting from FAD sets, and the development of improved FAD designs to reduce the incidence of entanglement of non-target species. Sets upper limit for FADs per vessel and sets marking requirements. Data recording and reporting requirements. Management plans must aim to minimise bycatch. Annex III specifies changes to design and deployment, including phasing out entangling FADs.
IOTC	Res. 17/05	2017	Concerning the conservation of sharks caught in association with fisheries managed by IOTC	All sharks	Finning prohibited ("fins-attached" for fresh sharks, 5% ratio for frozen; CPCs encouraged to move to fins-attached for frozen). Encourages live release of shark bycatch. Requires shark catch data reporting. Encourages shark research.
IOTC	Res. 15/09	2015	On a fish aggregating devices (FADs) working group	Mainly silky sharks	
IOTC	Res. 13/05	2013	On the conservation of whale sharks Rhincodon typus	Whale shark	Prohibits intentional purse seine sets on whale sharks, and requires safe release of accidentally encircled whale sharks. Requires reporting of data and encounters. CPCs should adopt non-entangling FADs (relevant to silky shark)
IOTC	Res. 13/06	2013	A scientific and management framework on the conservation of shark species caught in association with IOTC fisheries	Oceanic whitetip shark	Prohibits retention of oceanic whitetip shark (exemption for research sample collection). Encourages data collection and reporting for all sharks, and research.
IOTC	Res. 12/09	2012	On the conservation of thresher sharks (Family Alopiidae) caught in association with fisheries in the IOTC agreement area	Thresher sharks, Alopiidae, all species	Prohibits retention of thresher sharks in commercial fleets and by recreational/sports fishers. Mandates live release and data collection. Recreational fishers must carry gear to allow live release.
North East Atlantic Fisheries Commission (NEAFC)					
NEAFC	08	2021	Conservation and Management Measures for Piked dogfish (<i>Squalus acanthias</i>) in NEAFC Regulatory Area for 2021 & 2022.	Spurdog <i>Squalus acanthias</i> NOT CITES LISTED	Binding. Prohibits directed fishing. Live release of bycatch. Data. Encourages similar measures in national waters.
NEAFC	09	2020	Conservation and Management Measures for Deep Sea Sharks	Deep sea sharks NOT CITES LISTED	Binding. Prohibits directed fishing on deepwater sharks (17 named species) in the NEAFC Regulatory Area for 2020 to 2023

Annex 2. Regional Fisheries Management Organizations (RFMOs) with Conservation and Management Measures for sharks, rays and chimaeras (continued)

RFMO	CMM Ref	Date	Title	Species	Summary
NEAFC	10	2020	Conservation and Management Measures for Deep Sea Rays (Rajiformes)	Deep sea rays NOT CITES LISTED	Binding. Prohibits directed fishing on deepwater rays (Raja fyllae, Raja hyperborea, Raja nidarosiensis) in the NEAFC Regulatory Area
NEAFC	11	2020	Conservation and Management Measure for Deep Sea Chimaeras	Deep sea chimaeras NOT CITES LISTED	Binding. Prohibits directed fishing on deep sea chimaeras in the NEAFC Regulatory Area. 2020-2023
NEAFC	7	2020	Conservation and Management Measures for Porbeagle (Lamna nasus)	Porbeagle Lamna nasus	Binding. Prohibits directed fishing in NEAFC regulatory area. Live release of bycatch. Data. Encourages similar measures in national waters.
NEAFC	8	2020	Conservation and Management Measures for Basking Shark (Cetorhinus maximus)	Basking shark	Binding. No directed fishing in NEAFC Convention Area. Data reporting.
NEAFC	10	2015	Conservation of sharks associated with Fisheries Managed by the North-East Atlantic Fisheries Commission	All sharks	Binding. Mandates retention of all parts of the shark excepting head, guls & skins to the point of first landing. Prohibits removal of shark fins at sea, retention on board, transshipment, landing of shark fins. Data. Research. Gear selectivity.
Northwest Atlantic Fisheries Organization (NAFO)					
NAFO	Article 12	2019	Conservation and Enforcement Measures / Article 12 – Conservation and Management of Sharks	All sharks	Binding. CPs must report all catches: prohibit removal of shark fins on board vessels; prohibit retention, transshipment and landing of detached fins; encourage live release.
Southeast Atlantic Fisheries Organization (SEAFO)					
SEAFO	01/2008	2008	Banning of deep-water shark catches	Deepwater sharks	Non-binding. Recommended to ban deep-water shark directed fisheries until additional information becomes available to identify sustainable harvesting levels.
SEAFO	04/2006	2006	On the Conservation of Sharks Caught in Association with SEAFO Fisheries	All species	Binding. Report data. Prohibit finning (5% fin:carcass weight ratio). Encourage live release of bycatch. Research to identify ways to make gears more selective.
Western and Central Pacific Fisheries Commission (WCPFC)					
WCPFC	2019/04	2019	Conservation and Management Measures for Sharks	All sharks, rays, chimaeras	Binding. Implement IPOA–Sharks. Apply 'fins-attached'. Data collection. Bycatch mitigation (wire leaders and shark lines banned).
WCPFC	2019/04 (VI.20)	2019	Conservation and Management Measure for Sharks	Silky and Oceanic Whitetip sharks	Binding. Prohibits retention, landing, sale etc. Release promptly alive. Bycatch mitigation and live release guidelines, in addition to measures listed above.
WCPFC	2019/04 (VI.21)	2019	Conservation and Management Measure for Sharks	Whale sharks	Binding. CCMs shall prohibit setting a purse seine on tuna associated with a whale shark if sighted prior to the commencement of the set. If not deliberately encircled in the purse seine net, ensure safe release and report incident.
WCPFC	2019/05	2019	Conservation and Management Measure on Mobulid Rays caught in association with fisheries in the WCPFC Convention Area	Mobulid rays	Prohibits target fishing/intentional setting of nets on: retention, transshipment, landing; requires prompt live release. CMM includes best practice guidance.

Annex 3. Regional Fishery Bodies of relevance to or engaged in shark conservation and management

Acronym	Name	Ocean	Region	Website	CPPs	Tuna RFMO	RFMO	Advisory RFB	RSCAP	Shark action
APFIC	Asia-Pacific Fishery Commission	Indo-Pacific	Asia	http://www.apfic.org	21			✓		No
BOBP-IGO	Bay of Bengal Programme Inter-Governmental Organization	Indian Ocean/ Bay of Bengal	Asia	www.bobpigo.org	4			✓		✓
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources	Trans-ocean	Antarctic	www.ccamlr.org	25		✓		✓	✓
CCSBT	Commission for the Conservation of Southern Bluefin Tuna	Trans-ocean	Southern Oceans	www.ccsbt.org	14	✓				✓
CECAF	Fishery Committee for the Eastern Central Atlantic	Atlantic	Africa	-	34			✓		?
COMHAFAT-ATLAFCO	Ministerial Conf on Fisheries Cooperation among African States Bordering Atlantic	Atlantic	Africa	www.atlafco.org	14			✓		?
COREP	Regional Commission of Fisheries of Gulf of Guinea	Atlantic	Africa	www.corep-se.org	5			✓		?
CPPS	Permanent Commission for the South Pacific	Pacific	South America	www.cpps-int.org	4				✓	✓
CRFM	Caribbean Regional Fisheries Mechanism	Caribbean	Central-South America	www.crfm.int www.crfm.net	16			✓		✓
CSRP (SRFC)	Commission Sous-Regionale des Peches / Sub-Regional Fisheries Commission.	Atlantic	West Africa	www.spcsrp.org	7			✓		✓
CTMFM	Comisión Técnica Mixta del Frente Marítimo / Joint Technical Commission of the Maritime Front	Atlantic	South America - Argentina & Uruguay	www.ctmfm.org	2		✓			✓
FCWC	Fishery Committee of the West Central Gulf of Guinea	Atlantic	Africa	www.fcwc-fish.org	6			✓		?
FFA	Forum Fisheries Agency	Pacific	Pacific Islands	www.ffa.int	17			✓		✓
GFCM	General Fisheries Commission for the Mediterranean	Mediterranean	Mediterranean & Black Sea	www.gfcmonline.org	24		✓			✓
IATTC	Inter-American Tropical Tuna Commission	Pacific	West Americas	www.iattc.org	25	✓				✓
ICCAT	International Commission for the Conservation of Atlantic Tunas	Atlantic & adjacent seas	Scandinavia, Europe, Africa, Americas	www.iccat.int	51	✓				✓
ICES	International Council for the Exploration of the Sea	Atlantic	Scandinavia, Europe	www.ices.dk	20			✓		✓

Annex 3. Regional Fishery Bodies of relevance to or engaged in shark conservation and management (continued)

Acronym	Name	Ocean	Region	Website	CPPs	Tuna RFMO	RFMO	Advisory RFB	RSCAP	Shark action
IOTC	Indian Ocean Tuna Commission	Indian		www.iotc.org	34	✓				✓
NAFO	Northwest Atlantic Fisheries Organization	Atlantic	North America & Greenland	www.nafo.int	12		✓			✓
NEAFC	North-East Atlantic Fisheries Commission	Atlantic	Europe	www.neafc.org	5		✓			✓
NPFC	North Pacific Fisheries Commission	Pacific	Asia, North America	http://nwpbfo.nomaki.jp	7					No
OLDEPESCA	Latin American Organization for Fisheries Development/Organización Latinoamericana de Desarrollo Pesquero	Caribbean & Pacific	Latin America (N/C/S America)	http://www.oldepesca.com	12			✓		✓
OSPESCA	Central American Fisheries and Aquaculture Organization / Organización del Sector Pesquero y Acuicola del Istmo Centroamericano	Caribbean & Pacific	Central America	http://www.sica.int/ospesca	8			✓		✓
PERSGA	Regional Organization for the Conservation of the Environment of Red Sea and Gulf of Aden	Indian	Red Sea	www.persga.org	7			✓		✓
RECOFI	Regional Commission for Fisheries	Indian	Gulf	http://www.fao.org/fishery/rfb/recofi/en	8		✓			✓
SEAFDEC	Southeast Asian Fisheries Development Center	Pacific	Southeast Asia	www.seafdec.org	11			✓		✓
SEAFO	South East Atlantic Fisheries Organisation	Atlantic	Africa	www.seafo.org	7		✓			✓
SIOFA	South Indian Ocean Fisheries Agreement	Indian	Africa, Asia, Oceania		8		✓			No
SPC	Secretariat of the Pacific Community	Pacific	Oceania	www.spc.int	25			✓		✓
SPRFMO	South Pacific Regional Fisheries Management Organisation	Pacific	Oceania	www.sprfmo.int	14		✓			✓
WCPCF	Western and Central Pacific Fisheries Commission	Pacific	Oceania to Asia	www.wcpfc.int	43		✓			✓
WECAFC/COPACO	Western Central Atlantic Fishery Commission	Atlantic	North, Central, South America & Caribbean	http://www.fao.org/fishery/rfb/wecafc/en	34			✓		✓

Annex 4. Regional Seas Conventions and Action Plans (RSCAPs)

Convention/Action Plan	Region	Website	Action on sharks and rays	Parties
Abidjan Convention, WACAF	West Africa/ Southeast Atlantic	www.abidjanconvention.org	No. Decision CP.12/14: Illegal trade, illicit trafficking, consumption and other uses of protected, endangered and/or vulnerable marine and coastal fauna and flora. Mentions CITES, bycatch. Engaged in negotiations re. BBNJ instrument (on conservation and sustainable use of marine biodiversity in areas beyond national jurisdiction).	Angola, Benin, Cameroon, Cape Verde, Congo, Congo DR, Cote d'Ivoire, Equatorial Guinea, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mauritania, Namibia, Nigeria, Sao Tome and Principe, Senegal, Sierra Leone, South Africa, Togo
Antigua Convention for Cooperation in the Protection and Sustainable Development of the Marine and Coastal Environment of the Northeast Pacific	Pacific, Northeast	Not located	None known	Colombia, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama
Apia Convention / Secretariat of the Pacific Regional Environment Programme (SPREP)	Pacific	www.sprep.org	Shark Conservation Officer on staff	Australia, Cook Islands, Fiji, France, Kiribati, Marshall Islands, Micronesia (Federated States of), Nauru, New Zealand, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, USA, Vanuatu. (Territories: American Samoa, Guam, Northern Mariana Islands, French Polynesia, New Caledonia, Wallis & Futuna, Tokelau)
Barcelona Convention & Mediterranean Action Plan	Mediterranean	www.rac-spa.org	Regional Chondrichthyan Biodiversity Action Plan, Species listed in Annexes II and III to the Protocol on Specially Protected Areas. Annex II list adopted by GFCM for prohibited status	Albania, Algeria, Bosnia/Herzegovina, Croatia, Cyprus, Egypt, France, Greece, Israel, Italy, Lebanon, Libya, Malta, Monaco, Morocco, Montenegro, Slovenia, Spain, Syria, Tunisia, Turkey, EU
Cartagena Convention/Caribbean Environment Programme (CEP)	Caribbean	www.unenvironment.org/cep	Smalltooth sawfish <i>Pristis pectinata</i> added to Annex II of the Specially Protected Areas and Wildlife (SPAW) Protocol (2019). SPAW priorities include collaboration with CITES re. enforcement over illegal wildlife trade. Annex III spp. (exploitation regulated) include Oceanic Whitetip, Silky, & Whale sharks; Scalloped, Great & Smooth hammerhead sharks	Antigua & Barbuda, Bahamas, Barbados, Belize, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, France, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Netherlands, Nicaragua, Panama, St. Kitts & Nevis, Saint Lucia, St. Vincent and the Grenadines, Suriname, Trinidad & Tobago, UK, USA, Venezuela, EU
CCAMLR, Convention on the Conservation of Antarctic Marine Living Resources	Antarctic	www.ccamlr.org	Yes, see Annex 2	Argentina, Australia, Belgium, Brazil, Chile, China, European Union, France, Germany, India, Italy, Japan, Namibia, New Zealand, Norway, Poland, Republic of Korea, Russian Federation, South Africa, Spain, Sweden, Ukraine, UK, USA, Uruguay.

Convention/Action Plan	Region	Website	Action on sharks and rays	Parties
COBSEA coordinates the Action Plan for the Protection and development of the Marine and coastal areas of the East Asian Region	East Asia	www.cobsea.org	None known	Australia, Cambodia, China, Indonesia, Korea (Republic of), Malaysia, Philippines, Singapore, Thailand, Vietnam
Convention for the Protection of the Marine Environment and Coastal Areas of the South-East Pacific, SE Pacific AP	Pacific, Southeast	www.cpps-int.org	Regional Shark Plan	Chile, Colombia, Ecuador, Peru
HELCOM, coordinates the Helsinki Convention and the Baltic Sea Action Plan	Baltic	www.helcom.fi	None known	Estonia, Finland, Denmark, Germany, Latvia, Lithuania, Poland, Russian Federation, Sweden, European Community
Nairobi Convention (East Africa Action Plan)	Indian Ocean, Western	www.unep.org/NairobiConvention	Developing regional roadmap for shark and ray conservation and management, Reviewing proposed list of species of concern for inclusion on Protocol Annexes.	Comoros, France, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, Somalia, Tanzania, Republic of South Africa
North West Pacific Action Plan (no convention)	Pacific, Northwest	None	No	People's Republic of China, Republic of Korea, Japan, Russian Federation
OSPAR Convention, (Northeast Atlantic)	Atlantic, Northeast	www.ospar.org	List of Threatened and/or Declining species, including Basking shark, Porbeagle, Spiny dogfish; species case reports and recommendations. MOU with NEAFC.	Belgium, Denmark, EU, Finland, France, Germany, Iceland, Ireland, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, UK
PERSGA, Programme for the Environment of the Red Sea and Gulf of Aden	Red Sea and Gulf of Aden	www.persga.org	Also advisory RFB. Regional capacity-building in elasmobranch species identification and fisheries stock assessment for shark populations in PERSGA Member States. Training courses. Baseline surveys.	Djibouti, Egypt, Jordan, Kingdom of Saudi Arabia, Somalia, Sudan, Yemen
ROPME (Kuwait Convention and Action Plan)	Persian Gulf/ Gulf of Oman	www.ropme.net		Bahrain, Iran, Iraq, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates
South Asia Cooperative Environment Programme (SACEP) / South Asian Seas Action Plan (SASAP)	South Asia	www.sacep.org		Bangladesh, India, Maldives, Pakistan, Sri Lanka

Annex 5. Shark and ray species listed in Multilateral Environmental Agreements and Regional Fisheries Management Organization Conservation and Management Measures

SHARKS													
Scientific name	English name	MEA listings		International Trade			RFMO Conservation and Management Measures						
		CITES	CMS	Fins	Meat	Other	GFCM	IATTC	ICCAT	IOTC	WCPFC	Other	
<i>Carcharhinus falcoformis</i>	Silky shark	II	II	XX				2019-04 2018-05	BYC 11-08, 12-05, 13-10, 16-19	19/03, 15/09, 18/04, 18/08	2019-04 VI.20		
<i>Carcharhinus longimanus</i>	Oceanic whitetip shark	II	I	X				2011-10	BYC 10-07, 12-05, 13-10, 16-19	2013/06	2019-04 VI.20		
<i>Carcharhinus obscurus</i>	Dusky shark	-	II	X									
<i>Prionace glauca</i>	Blue shark	-	II	XX	XX				BYC 19-07 & 08	2018/02			
<i>Sphyrna lewini</i>	Scalloped hammerhead	II	II	X			36/2012/3	2016-05	BYC 10-08, 12-05, 13-10, 16-19				
<i>Sphyrna mokarran</i>	Great hammerhead	II	II	X			36/2012/3	2016-05	BYC 10-08, 12-05, 13-10, 16-20				
<i>Sphyrna zygaena</i>	Smooth hammerhead	II	II	X			36/2012/3	2016-05	BYC 10-08, 12-05, 13-10, 16-21				
<i>Alopias pelagicus</i>	Pelagic Thresher	II	II	X						2012/09			
<i>Alopias superciliosus</i>	Bigeye Thresher	II	II	X					BYC 09-07, 12-05, 13-10, 16-19	2012/09			
<i>Alopias vulpinus</i>	Common Thresher	II	II	X	X				BYC 09-07	2012/09			
<i>Cetorhinus maximus</i>	Basking Shark	II	III				36/2012/3						NEAFC 20-08
<i>Carcharodon carcharias</i>	White Shark	II	III			X							
<i>Isurus oxyrinchus</i>	Shortfin mako	II	II	X	X		36/2012/3		BYC 19-06, 14-06, 10-06				
<i>Isurus paucus</i>	Longfin mako	II	II	X									
<i>Lamna nasus</i>	Porbeagle shark	II	II	X	X		36/2012/3		BYC 15-06				NEAFC 20-07
<i>Rhincodon typus</i>	Whale Shark	II	III		X			2019-06		2013/05	2019-04 VI.20		
<i>Squalus acanthias</i>	Spiny dogfish	-	II		X		39/2015/4						NEAFC 21-08
<i>Squatina squatina</i>	Angels shark	-	III				36/2012/3						
Key:	Oceanic-pelagic/primarily pelagic species						Coastal, benthic species						

Annex 5. Shark and ray species listed in Multilateral Environmental Agreements and RFMO Conservation and Management Measures (continued)

RAYS													
Scientific name	English name	MEA listings		International Trade			RFMO Conservation and Management Measures						
		CITES	CMS	Fins	Meat	Other	GFCM	IATTC	ICCAT	IOTC	WCPFC	Other	
<i>Manta alfredi</i>	Reef Manta Ray	II	III			✗		2015-04		2019-03	2019-05		
<i>Manta birostris</i>	Oceanic Manta Ray	II	III			✗		2015-04		2019-03	2019-05		
<i>Mobula eregoodootenkee</i>	Pygmy Devil Ray	II	III			✗		2015-04		2019-03	2019-05		
<i>Mobula hypostoma</i>	Atlantic Devil Ray	II	III										
<i>Mobula japonica</i>	Spintail Mobula	II	III			✗		2015-04					
<i>Mobula kuhlii</i>	Shorfin Devil Ray	II	III			✗		2015-04		2019-03	2019-05		
<i>Mobula mobular</i>	Giant Devil Ray	II	III			✗		36/2012/3		2019-03	2019-05		
<i>Mobula munkiana</i>	Munk's Devil Ray	II	III			✗		2015-04					
<i>Mobula rochebrunei</i>	Lesser Guinean Devil Ray	II	III										
<i>Mobula tarapacana</i>	Chilean Devil Ray	II	III			✗		2015-04		2019-03	2019-05		
<i>Mobula thurstoni</i>	Bentfin Devil Ray	II	III			✗		2015-04		2019-03	2019-05		
<i>Anoxypristis cuspidata</i>	Narrow sawfish	I	III										
<i>Pristis clavata</i>	Dwarf Sawfish,	I	III										
<i>Pristis pectinata</i>	Smalltooth Sawfish	I	III					36/2012/3					
<i>Pristis pristis</i>	Largetooth Sawfish	I	III					36/2012/3					
<i>Pristis zijsron</i>	Green Sawfish	I	III										
<i>Rhynchobatus australiae</i>	White-spotted/ Bottlenosed Wedgefish	II	III			✗							
<i>Rhynchobatus djiddensis</i>	White-spotted Wedgefish	II				✗							
Family Rhinidae	White-spotted Wedgefishes	II				✗							
<i>Rhinobatos rhinobatos</i>	Common Guitarfish	II	(I) II			✗							
<i>Glaucostegus cemiculus</i>	Blackchin Guitarfish	II				✗		36/2012/3					
Family Glaucostegidae	Giant Guitarfishes	II				✗		36/2012/3					
Key:	Oceanic-pelagic/primarily pelagic species											Coastal, benthic species	

Annex 6. Capture production (mt) by species and groups of species, 2009–2018.

Source: FAO (2020) FishStat. Those species marked with an asterisk* were assessed with regards to their management risk (see Annex 1; Lack et al. 2014).

Species/Grouping	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Species										
Blue shark*	89 216	110 182	130 005	135 340	138 686	120 298	103 636	109 419	103 738	100 000
Picked dogfish*	15 637	13 186	15 515	18 073	13 234	17 024	15 725	17 870	16 968	13 714
Shortfin mako*	11 940	12 108	14 475	14 165	13 354	14 067	11 777	13 354	12 615	11 684
Small-spotted catshark	6 124	6 463	6 568	6 162	7 119	6 776	7 637	8 225	7 474	7 890
Narrownose smooth-hound	9 476	8 264	6 867	6 062	4 572	4 538	4 420	4 014	3 142	2 711
Silky shark*	4 859	8 920	8 681	7 133	7 413	5 446	4 818	6 247	6 064	7 474
Thornback ray	3 588	4 378	4 663	5 305	5 576	5 409	5 370	5 516	5 927	6 468
Tope shark	5 328	5 233	4 724	4 452	4 330	4 360	4 308	4 069	4 013	4 045
Whitespotted wedgefish	9 002	3 498	4 241	3 097	3 492	7 483	3 540	2 268	707	500
Little skate	3 836	4 214	4 511	4 987	5 008	4 235	3 619	3 220	2 925	3 754
Argentine angelshark	5 276	5 534	4 568	3 726	3 066	3 217	2 989	2 957	2 425	2 002
Cuckoo ray	4 309	5 419	4 892	3 850	3 266	3 479	3 562	3 131	3 014	3 292
Pelagic thresher*	190	225	212	232	6 927	6 114	5 096	4 976	4 767	3 880
Southern stingray	25	26	542	1 943	3 141	2 641	3 107	6 734	6 094	7 310
Gummy shark	2 653	2 365	2 325	2 150	2 299	2 229	2 324	2 650	2 677	2 504
Milk shark	0	516	634	3 017	3 295	4 050	4 161	3 025	7 660	3 613
Plownose chimaera	3 805	2 700	2 904	2 183	1 533	1 336	3 123	2 500	1 820	1 909
Blonde ray	1 323	2 028	2 223	2 300	2 321	2 498	2 549	2 390	2 332	2 724
Dark ghost shark	1 993	2 229	2 184	2 300	1 584	1 641	1 326	1 348	1 443	1 330
New Zealand rough skate	1 922	1 962	1 714	1 609	2 080	1 960	1 532	1 554	1 984	1 487
Spotted ray	1 527	1 497	1 877	1 887	1 678	1 623	1 510	1 553	1 606	1 969
Ghost shark	1 650	1 610	1 443	1 511	1 668	1 392	1 433	1 476	1 575	1 320
Spotted estuary smooth-hound	1 244	1 318	1 277	1 332	1 324	1 364	1 394	1 425	1 527	1 369
Smooth-hound	314	512	1 820	1 063	1 396	1 093	1 187	1 272	1 358	3 213
Starry ray	711	1 039	1 337	1 880	1 752	1 643	1 246	1 213	491	771
Lusitanian cownose ray	0	1 166	1 125	2 911	1 129	1 596	1 569	796	2 369	273
Pacific angelshark*	882	1 116	813	778	924	984	1 093	905	1 236	1 053
Blackmouth catshark	443	418	875	898	1 070	1 599	1 719	1 363	1 329	1 782
Kitefin shark*	257	282	198	155	1 207	2 057	1 952	2 412	1 232	433
Dusky smooth-hound	1 231	1 747	1 264	1 007	950	831	593	454	540	575
Nursehound*	713	709	792	564	707	629	826	1 099	995	1 163
Cape elephantfish	623	859	765	781	660	632	1 010	600	1 007	524
New Zealand smooth skate	525	573	565	573	580	645	657	706	866	744
Angelshark*	76	97	79	125	50	125	183	175	132	5 951
Yellownose skate	1 331	1 459	714	817	628	432	562	549	264	282
Night shark	0	0	0	0	0	1 237	1 190	911	1 145	1 040
Oceanic whitetip shark*	1 058	1 085	752	694	395	217	303	76	165	391
Atlantic sharpnose shark	359	304	299	253	406	353	455	400	514	550

Annex 6. Capture production (mt) by species and groups of species, 2009–2018 (continued)

Species/Grouping	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Spottail shark	0	0	0	707	896	564	997	409	274	478
Whitecheek shark	0	0	0	354	438	1 107	499	818	544	239
Rabbit fish	189	288	402	453	550	479	295	309	351	360
Porbeagle*	736	270	157	231	144	132	107	61	90	69
Blacktip shark	187	179	353	391	260	385	128	186	194	158
Shagreen ray	321	434	359	323	321	264	261	209	252	269
Leafscale gulper shark	453	382	215	183	120	184	97	114	113	156
Blackchin guitarfish	0	161	119	46	97	170	241	153	242	1 770
Lowfin gulper shark*	438	271	590	655	559	0	0	0	0	0
Sandy ray	165	240	252	251	239	249	245	252	254	270
Birdbeak dogfish	207	147	136	83	138	245	246	366	327	411
Thresher*	327	250	169	171	187	168	149	143	196	85
Smooth hammerhead*	132	61	167	294	483	183	280	200	115	41
Nurse shark*	155	188	257	248	266	240	212	85	115	14
Bigeye thresher*	104	27	27	87	440	403	248	245	267	257
Small-eyed ray	224	334	270	298	223	229	209	97	192	260
Longnosed skate	84	20	49	44	42	145	419	393	448	661
Blue skate	205	158	172	154	145	139	146	123	157	197
Giant guitarfish	104	98	135	187	215	174	241	295	332	303
Pacific guitarfish	79	47	85	780	147	296	2	162	93	101
Scalloped hammerhead*	109	336	212	265	237	55	121	94	166	28
Portuguese dogfish	160	120	0	1	52	5	3	4	4	3
Blacknose shark	60	19	20	27	22	19	29	394	415	412
Longnose spurdog	14	21	0	0	220	261	109	218	146	165
Rio skate	237	417	221	108	89	24	9	15	0	2
Smallnose fanskate	187	424	84	96	54	85	67	17	27	72
Spotted eagle ray	0	0	0	0	0	0	0	358	370	370
Japanese topeshark	0	589	488	0	0	0	0	0	0	0
Spiny butterfly ray	9	152	49	60	75	196	69	88	272	9
Smooth butterfly ray	0	0	0	0	0	0	0	331	340	340
Sandbar shark*	105	90	68	15	34	54	27	18	77	0
Mediterranean starry ray	3	6	8	6	38	34	168	151	212	321
Tiger shark*	77	49	114	76	33	79	55	70	125	130
Knifetooth dogfish*	171	221	4	3	1	1	0	0	0	0
Bull shark*	86	60	136	41	32	125	18	50	72	59
Caribbean sharpnose shark	0	0	0	0	0	0	0	263	297	283
White skate*	87	83	64	27	28	18	91	108	223	75
Big skate	1	0	0	4	21	41	35	312	196	135
Undulate ray	26	12	22	8	3	22	69	133	218	228
Eyespot skate	73	288	43	35	16	29	18	139	78	25
Spinetail mobula	50	52	57	66	87	75	87	101	51	41
Copper shark*	86	112	39	76	31	67	48	57	60	11
Whiteleg skate	187	56	29	107	33	55	17	33	25	20
Longfin mako*	0	2	0	2	20	64	42	41	287	148

Annex 6. Capture production (mt) by species and groups of species, 2009–2018 (continued)

Species/Grouping	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Gulper shark*	41	8	9	11	5	7	14	9	20	16
Draughtsboard shark	48	64	91	121	74	33	31	15	18	23
Greenland shark	31	49	16	17	6	24	13	47	110	163
Brown ray	0	0	0	0	0	2	56	74	121	282
Sharpnose stingray	36	37	35	34	42	40	53	63	60	48
Velvet belly	5	16	8	15	21	49	32	63	133	118
Longtail stingray	0	0	0	0	1	1	0	1	185	90
Common eagle ray	37	22	67	23	32	39	46	42	58	33
Atlantic weasel shark	0	14	17	6	1	25	54	66	248	0
Bluntnose sixgill shark*	35	33	22	26	64	34	53	36	50	33
Giant manta	0	0	0	0	0	0	0	0	201	177
Broadnose skate	182	0	42	25	11	41	57	0	0	0
Barbeled houndshark	0	111	82	17	24	2	72	50	0	0
Brazilian sharpnose shark	0	0	0	0	0	0	0	106	119	110
Finetooth shark	41	9	32	11	56	6	5	3	11	44
Angular roughshark*	76	50	19	3	4	2	2	2	4	4
Smalltail shark*	0	0	0	0	0	0	0	103	104	103
Longnose velvet dogfish	33	9	0	1	21	14	9	16	11	10
Cownose ray	0	80	128	2	6	0	0	0	0	0
Common guitarfish	90	69	44	44	0	1	3	2	27	8
Lemon shark*	48	25	39	29	13	9	18	1	20	27
Spinner shark	18	13	40	8	25	40	18	31	40	32
Spinetail ray	0	0	0	0	0	0	0	0	67	164
Arrowhead dogfish	0	3	2	7	1	0	9	108	90	0
Sailray	0	0	17	13	12	8	31	15	28	93
Great hammerhead	0	0	0	0	17	19	22	44	44	67
Eaton's skate	8	14	5	2	36	22	5	21	45	31
Starry smooth-hound	15	7	8	30	19	16	19	20	16	20
Black dogfish*	95	81	0	1	0	9	0	0	0	0
Broadnose sevengill shark*	27	25	17	20	13	18	13	9	5	4
Kerguelen sandpaper skate	1	0	16	0	55	55	7	9	13	15
Chola guitarfish	0	26	3	10	12	38	15	12	0	53
Bonnethead	34	6	17	13	14	6	4	1	4	0
Great white shark*	0	18	92	11	25	7	0	0	0	0
Spotback skate	25	60	4	4	5	8	5	16	0	0
Common stingray	6	12	9	11	7	10	13	6	7	8
Basking shark*	7	0	2	22	0	0	0	0	0	0
Bignose fanskate	53	39	0	1	0	0	0	0	1	0
Arctic skate	1	3	2	2	2	2	23	6	12	13
Patagonian skate	20	12	0	24	0	0	0	0	0	1
Norwegian skate	5	0	0	0	0	0	0	0	0	0
California butterfly ray	0	0	0	0	0	0	0	0	0	0
Leopard shark	2	3	2	3	1	3	4	5	4	4
Antarctic starry skate	6	5	3	0	1	0	0	2	0	5

Annex 6. Capture production (mt) by species and groups of species, 2009–2018 (continued)

Species/Grouping	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Brown smooth-hound	2	3	0	0	10	1	0	3	11	0
Pacific sleeper shark*	1	1	2	0	5	0	8	5	7	4
Slender smooth-hound	0	0	1	2	0	1	11	6	3	8
Mouse catshark	7	5	5	1	4	4	2	0	0	0
Great lanternshark	0	0	0	0	0	0	0	0	0	0
Pacific cownose ray	0	0	0	0	0	0	0	0	0	17
Sharptooth houndshark	2	0	3	0	1	1	1	1	2	0
Devil fish	3	4	5	0	1	0	0	0	0	0
Crocodile shark*	0	0	0	0	0	0	0	0	0	0
Chilean torpedo	0	0	0	0	0	0	0	0	0	12
Murray's skate	2	1	1	0	2	2	0	0	1	1
Whiptail stingray	0	0	0	0	0	0	0	0	0	9
Sharpnose sevengill shark	2	2	0	0	0	2	0	0	0	0
Sand tiger shark*	5	1	0	1	0	0	0	0	0	0
Silver chimaera	0	0	0	1	0	0	1	5	0	0
Little sleeper shark*	0	0	3	0	0	0	0	0	0	0
Bramble shark*	2	1	0	1	0	0	0	0	0	0
Round ray	1	1	0	1	0	0	0	0	0	0
Plunket shark	0	0	0	0	0	1	3	0	0	0
Sailfin roughshark*	0	0	0	1	0	0	0	0	0	0
Spotted ratfish	0	0	0	0	0	0	0	0	0	2
Roughtail stingray	0	0	0	0	0	0	2	0	0	0
Madeiran ray	1	0	0	0	0	0	0	0	0	0
Pelagic stingray	0	0	0	1	0	0	0	0	0	0
Roughskin dogfish	0	0	0	0	1	0	0	0	0	0
Whip stingray	0	0	0	0	0	0	0	0	0	0
Dusky catshark	0	0	0	0	0	0	0	0	0	0
McCain's skate	0	0	0	0	0	0	0	0	0	0
Dusky shark*	0	0	0	0	0	0	0	0	0	0
Straightnose rabbitfish	0	0	0	0	0	0	0	0	0	0
Dark-belly skate	0	0	0	0	0	0	0	0	0	0
Annual subtotal (mt) by species	200 338	222 847	244 925	252 854	256 506	244 920	220 339	213 621	226 257	222 522

*Assessed M-Risk species not listed as species-specific landings by FAO:

Deepwater Spiny Dogfish *Centrophorus squamosus*

Shovelnose Spiny Dogfish *Deania calcea*

Common smoothhound *Mustelus mustelus*

Spotted smoothhound *Mustelus lenticulatus*

Large sleeper shark *Somniosus microcephalus*

Annex 6. Capture production (mt) by species and groups of species, 2009–2018 (continued)

Species/Grouping	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Grouping										
Sharks, rays, skates, etc. nei	247 988	226 407	244 511	250 405	251 207	215 705	222 641	221 244	209 996	194 400
Rays, stingrays, mantas nei	122 477	118 440	117 424	121 385	110 058	116 772	153 212	148 954	133 264	141 176
Stingrays, butterfly rays nei	45 590	38 294	40 983	47 746	45 080	50 004	27 185	31 361	17 601	33 884
Requiem sharks nei	40 150	35 807	34 486	39 688	35 581	40 184	29 390	26 472	25 049	18 254
Rays and skates nei	29 075	24 854	21 434	19 619	15 958	17 594	16 218	16 295	16 792	14 821
Hammerhead sharks, etc. nei	4 673	6 611	6 487	4 388	4 459	5 940	7 026	10 334	7 277	10 625
Smooth-hounds nei	13 250	12 637	13 534	10 762	11 059	12 627	14 818	13 294	13 408	9 801
Dogfish sharks nei	13 618	10 446	7 459	9 049	8 705	8 393	7 059	8 208	8 383	8 314
Various sharks nei	11 221	12 280	11 207	1 895	2 895	2 927	3 277	1 302	1 666	1 220
Mantas, devil rays nei	2 414	2 447	3 731	5 935	6 318	4 651	4 803	8 083	7 218	7 217
Eagle rays nei	4 849	4 314	4 379	4 203	6 460	9 078	8 220	6 493	6 965	4 748
Thresher sharks nei	12 283	18 423	22 478	13 594	14 796	12 880	5 136	4 795	4 888	4 116
Guitarfishes, etc. nei	2 383	1 971	2 065	1 889	2 682	5 176	5 256	2 941	1 810	3 788
Ratfishes nei	1 186	1 141	723	739	815	841	844	796	1 038	1 094
S.Am. freshwater stingrays nei	0	0	743	749	755	910	896	865	838	835
Catsharks, etc. nei	499	412	466	493	514	532	522	483	623	607
Catsharks, nursehounds nei	1 002	937	992	878	570	499	539	619	706	597
Angelsharks, sand devils nei	178	247	186	202	262	187	142	434	453	469
Sawsharks nei	374	310	367	266	314	285	290	268	310	302
Sawfishes	201	463	94	57	313	17	405	271	55	281
Mackerel sharks, porbeagles nei	1 272	1 079	1 333	1 440	1 410	1 508	1 193	1 161	327	268
Lanternsharks nei	65	63	40	36	91	267	250	175	299	266
Chimaeras, etc. nei	122	104	99	92	116	114	123	115	115	145
Torpedo rays	96	106	110	70	77	78	79	67	83	74
Dogfishes and hounds nei	821	901	921	932	852	853	922	28	61	62
Mobula nei	0	0	0	0	0	0	0	0	0	49
Mako sharks	33	13	23	21	17	10	24	29	21	40
Bathyraja rays nei	0	0	0	0	0	0	2	2	7	3
Psammobatis sand skates nei	0	0	0	0	0	0	0	0	0	0
Elephantfishes, etc. nei	0	0	0	0	0	0	0	0	0	0
Stingrays nei	0	0	0	0	0	0	0	0	0	0
Annual subtotal (mt) by grouping	555 820	518 707	536 275	536 533	521 364	508 032	510 472	505 089	459 253	457 457
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Annual subtotal (mt) by species	200 338	222 847	244 925	252 854	256 506	244 920	220 339	213 621	226 257	222 522
Annual subtotal (mt) by grouping	555 820	518 707	536 275	536 533	521 364	508 032	510 472	505 089	459 253	457 457
Annual total (mt)	756 158	741 554	781 200	789 387	777 870	752 952	730 811	718 710	685 510	679 979

Conf. 12.6

(Rev. CoP18)*

Conservation and management of sharks¹

RECOGNIZING that many sharks are particularly vulnerable to overexploitation owing to their late maturity, longevity and low fecundity;

RECOGNIZING that there is a significant international trade in sharks and their products;

RECOGNIZING that unregulated and unreported trade is contributing to unsustainable fishing of a number of shark species;

RECOGNIZING the duty of all States to cooperate, either directly or through appropriate sub-regional or regional organizations in the conservation and management of fisheries resources;

RECALLING that a number of shark species are included in Appendices I and II;

NOTING the complexity of the implementation of CITES trade controls for shark trade, but also the notable successes in the implementation of the shark and ray listings;

RECALLING that in accordance with the relevant provisions of the Convention, international trade in CITES-listed sharks and their parts and derivatives shall only take place if it is legally acquired, non-detrimental to the survival of the species in the wild and properly reported;

CONCERNED that outstanding implementation challenges need to be addressed to ensure that international trade in CITES-listed sharks and their parts and derivatives is conducted and managed in accordance with the provisions of the Convention;

WELCOMING the availability of several guidelines and examples for the making of non-detriment findings (NDFs) for trade in CITES-listed sharks;

RECOGNIZING that the International Plan of Action on the Conservation and Management of Sharks (IPOA- sharks) was prepared by the Food and Agriculture Organization of the United Nations (FAO) in 1999 and that all States whose vessels conduct directed fisheries or regularly take sharks in non-directed fisheries are encouraged by FAO's Committee on Fisheries (COFI) to adopt a National Plan of Action for the Conservation and Management of Shark Stocks (NPOA-Sharks);

NOTING that there has been slow progress with the development and implementation of NPOAs;

CONCERNED that insufficient progress has been made in achieving shark management through the implementation of IPOA-Sharks except in States where comprehensive shark assessment reports and NPOA- Sharks have been developed; and

WELCOMING the entry into force of the FAO Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing in 2016 and recognizing the value it offers to improve compliance with CITES provisions for listed shark and ray species;

* Amended at the 15th, 16th, 17th and 18th meetings of the Conference of the Parties.

¹ For the purposes of this Resolution, the term "shark" is taken to include all species of sharks, skates, rays and chimaeras, in alignment with the Food and Agriculture Organization (FAO) International Plan of Action for the Conservation and Management of Sharks (IPOA- Sharks).

THE CONFERENCE OF THE PARTIES TO THE CONVENTION

1. INSTRUCTS the Secretariat to maintain close collaboration with FAO, Regional Fisheries Management Organizations (RFMOs) and Regional Fishery Bodies (RFBs), the Convention on the Conservation of Migratory Species of Wild Animals (CMS) and other relevant international organizations to improve coordination and synergies in the implementation of CITES provisions for CITES-listed shark species;
2. ENCOURAGES the Secretariat and Parties to continue to assist in building financial and technical capacity in developing countries for shark and ray activities under CITES;
3. ENCOURAGES Parties to improve data collection and reporting (where possible by species and gear type), adopt management and conservation measures for shark species, and enhance implementation and enforcement of these actions through domestic, bilateral, RFMOs or other international measures;
4. URGES Parties that are shark fishing States, that have not yet done so, to develop NDFs, as well as an NPOA, at the earliest opportunity or, when insufficient information is available, take steps to improve research and data collection at the species level on both fisheries and trade as a first step towards developing an NPOA Sharks and making NDFs, with a view to establishing long-term data collection on the status of shark and ray stocks;
5. INVITES Parties that engage in directed or non-directed shark fishing activities of shared stocks to collect and share, on a regional basis such as through RFMOs/RFBs or other regional collaborations, where they exist, data on effort, catches, live releases, discards, landings and trade (to species level and by gear type where possible), and make this information available to assist Scientific Authorities in the making of NDFs of such shared stocks;
6. ENCOURAGES Parties that are members of or Parties to other relevant international instruments, such as RFMOs, RFBs or CMS, to improve coordination between the respective national focal points, where appropriate, and work through the respective mechanisms of these instruments to strengthen research, training and data collection and improve coordination with activities under CITES;
7. FURTHER ENCOURAGES Parties to share information about stricter domestic measures pertaining to shark fisheries and trade, in particular zero export quotas or trade bans;
8. REQUESTS Management Authorities to collaborate with their national customs authorities to expand their current classification system to allow for the collection and reporting of detailed data on shark trade including, where possible, separate categories for processed and unprocessed products, for meat, cartilage, skin and fins, and to distinguish imports, exports and re-exports and between shark fin products that are dried, wet, processed and unprocessed fins. Wherever possible, these data should be species-specific;
9. INSTRUCTS the Secretariat to monitor discussions within the World Customs Organization regarding the development of a customs data model, and the inclusion therein of a data field to report trade in sharks at species level, and to issue Notifications to the Parties concerning any significant developments;
10. ENCOURAGES Parties, in close cooperation with FAO, RFBs and RFMOs, to undertake or facilitate continued research to improve understanding of the nature of illegal, unreported and unregulated (IUU) fishing concerning sharks, identify the linkages between international trade in shark fins and meat, and IUU fishing;
11. FURTHER ENCOURAGES Parties, intergovernmental and non-governmental bodies to develop robust, low-cost tools and systems, where not already existing, to ensure that shark species, in particular CITES- listed species, are identified accurately at the first point of capture/landing, and undertake studies of trade in all shark products;
12. INVITES Parties to share through the Secretariat their experiences in implementing CITES provisions for listed shark species, in particular NDFs, legal acquisition findings and traceability systems;

13. DIRECTS the Animals Committee to periodically examine new information provided by range States on the implementation of the shark listings and other available relevant data and information;
14. DIRECTS the Animals Committee to make species-specific recommendations if necessary on improving the conservation status of sharks and implementation of shark and ray listings;
15. DIRECTS the Standing Committee to provide guidance on regulatory matters in connection to the implementation of the shark listings, including but not limited to the determination of legal acquisition, traceability and enforcement issues, as appropriate; and
16. DIRECTS the Animals Committee and Standing Committee to report progress on shark and ray activities at the meetings of the Conference of the Parties, as appropriate.

CoP18 DECISIONS ON SHARKS AND RAYS (*ELASMOBRANCHII SPP.*)¹

18.218 Decision directed to: Parties

Parties are encouraged to:

- a) provide information to the Secretariat in support of the study called for in Decision 18.221 paragraph a), in particular on any national management measures that prohibit commercial take or trade, and in response to the Notification called for in Decision 18.220;
- b) in accordance with their national legislation, provide a report to the Secretariat about the assessment of stockpiles of shark parts and derivatives for CITES-listed species stored and obtained before the entry into force of the inclusion in CITES in order to control and monitor their trade, if applicable;
- c) inspect, to the extent possible under their national legislation, shipments of shark parts and derivatives in transit or being transhipped, to verify presence of CITES-listed species and verify the presence of a valid CITES permit or certificate as required under the Convention or to obtain satisfactory proof of its existence; and
- d) continue to support the implementation of the Convention for sharks, including by providing funding for the implementation of Decisions 18.219, 18.221 and 18.222, and considering seconding staff members with expertise in fisheries and the sustainable management of aquatic resources to the Secretariat.

18.219 Decision directed to: Secretariat

Subject to external funding, the Secretariat shall continue to provide capacity-building assistance for implementing Appendix-II shark and ray listings to Parties upon request.

18.220 Decision directed to: Secretariat

The Secretariat shall:

- a) issue a Notification to the Parties, inviting Parties to:
 - i) provide concise summaries of new information on their shark and ray conservation and management activities, in particular:

¹ For the purposes of these Decisions, the term "shark" is taken to include all species of sharks, skates, rays and chimaeras, in alignment with the Food and Agriculture Organization (FAO) International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks).

- A. the making of non-detriment findings;
 - B. the making of legal acquisition findings;
 - C. the identification of CITES-listed shark-products in trade; and
 - D. recording stockpiles of commercial and/or pre-Convention shark fins for CITES Appendix-II elasmobranch species and controlling the entry of these stocks into trade; and
- ii) highlight any questions, concerns or difficulties Parties are having in writing or submitting documentation on authorized trade for the CITES Trade Database;
- b) provide information from the CITES Trade Database on commercial trade in CITES-listed sharks and rays since 2000, sorted by species and, if possible, by product;
- c) disseminate existing guidance identified, or newly developed, guidance on the control and monitoring of stockpiles of shark parts and derivatives pursuant to paragraph 18.224 paragraph b) by the Standing Committee; and
- d) collate this information for the consideration of the Animals Committee and the Standing Committee.

18.221 Decision directed to: Secretariat

The Secretariat shall, subject to external funding, and in collaboration with relevant organizations and experts:

- a) conduct a study to investigate the apparent mismatch between the trade in products of CITES- listed sharks recorded in the CITES Trade Database and what would be expected against the information available on catches of listed species;
- b) bring the results of the study in a) to the attention of the Animals Committee or Standing Committee, as appropriate.

18.222 Decision directed to: Secretariat

The Secretariat, subject to external funding, is requested to collaborate closely with the Food and Agriculture Organization of the United Nations (FAO) to:

- a) verify that information about Parties' shark management measures are correctly reflected in the shark measures database developed by FAO (<http://www.fao.org/ipoa-sharks/database-of-measures/en/>) and, if not, support FAO in correcting the information;
- b) compile clear imagery of wet and dried unprocessed shark fins (particularly, but not exclusively, those from CITES-listed species) along with related species level taxonomic information to facilitate refinement of iSharkFin software developed by FAO;
- c) conduct a study analysing the trade in non-fin shark products of CITES-listed species, including the level of species mixing in trade products and recommendations on how to address any implementation challenges arising from the mixing that may be identified; and
- d) bring the results of activities a) to c) to the attention of the Animals Committee or Standing Committee, as appropriate.

18.223 Decision directed to: Animals Committee

The Animals Committee, in collaboration with relevant organisations and experts, shall:

- a) continue to develop guidance to support the making of NDFs, in particular in data-poor, multi-species, small-scale/artisanal, and non-target (bycatch) situations, for CITES-listed shark species; and
- b) report the outcomes of its work under Decision 18.223, paragraph a) to the 19th meeting of the Conference of the Parties.

18.224 Decision directed to: Standing Committee

The Standing Committee shall:

- a) develop guidance on the making of legal acquisition findings, and related assessments for introductions from the sea for CITES-listed shark species in the context of the implementation of Resolution Conf. 18.7 on Legal acquisition findings;
- b) develop new guidance or identify existing guidance on the control and monitoring of stockpiles of shark parts and derivatives, in particular for specimens caught prior to the inclusion of the species in Appendix II; and
- c) report its findings under Decision 18.224, paragraphs a) and b) to the 19th meeting of the Conference of the Parties.

18.221 Decision directed to: Animals Committee and Standing Committee

The Animals Committee and Standing Committee shall analyse and review the results of any of the activities under Decisions 18.221 and 18.222 brought to their attention by the Secretariat, and with the support of the Secretariat prepare a joint report for the 19th meeting of the Conference of the Parties on the implementation of these Decisions.