CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA

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Conservation and management of sharks

TRADE-RELATED THREATS TO SHARKS

1. This document has been prepared by the intersessional Shark Working Group of the Animals Committee

Introduction and background

2. Sharks[1] and their relatives play an important role in the ecosystem and as a human food resource. They are a traditional and important source of food, income and employment for many communities, including coastal and rural peoples. They are also of cultural and spiritual importance in many States and communities. Recent changes in fisheries technology and economic developments have resulted in intensified fishing effort and mortality through domestic consumption, international trade and bycatch (see Box 1 for definitions of bycatch). Non-consumptive uses are also of increasing importance in some States. These developments have led to the adoption of the United Nations' Food and Agriculture Organization (UN FAO) International Plan of Action for Sharks (IPOA-Sharks) and a number of CITES Resolutions and Decisions on the conservation and management of sharks.

3. This document addresses the task set for the Animals Committee by Decision 13.43 to identify specific cases where trade is having an adverse impact on sharks.

4. The Working Group agreed that the most important challenge for managers is to ensure that the rate of removal of animals from wild populations is sustainable. Some carefully managed shark fisheries are sustainable, but many fisheries, however, are inadequately monitored and/or unmanaged, resulting in unsustainable levels of mortality for most[2] shark and ray species, although the data required to assess their status and to form the basis for management decisions are seriously lacking for many stocks. Over 25 % of all chondrichthyan species evaluated for the IUCN Red List of Threatened Species have been assessed as Threatened (Critically Endangered, Endangered or Vulnerable), 25 % as Least Concern and nearly 37 % as Data Deficient (IUCN in press 2006).

5. Removal of sharks from the ecosystem may also result in detrimental ecosystem impacts, which are also of concern to fisheries and environmental managers. Illegal, unregulated and unreported (IUU) fisheries in State waters and on the high seas contribute to these species' declines and the broader ecosystem impacts. There is also a significant (often legal) contribution by foreign fleets to

[1] *Unless otherwise specified, 'sharks' is the term used to include all chondrichthyan fish species: the sharks, rays and chimaeras.*

[2] *One Working Group participant subsequently suggested that 'some' was more appropriate. However, all available evidence indicates that the current levels of mortality are indeed unsustainable for the majority of unmanaged stocks.*

unsustainable shark mortality within EEZs[3], with consequent implications for shark stocks, food security, and socio-economic stability. The overall lack of reliable data from both IUU and legal fisheries makes evaluation of impacts and introduction of management challenging.

Box 1. Definition of bycatch

The Working Group noted the confusion that may arise from the use of the term 'bycatch', which is applied differently in many parts of the world. Part of the uncertainty arises because "yesterday's bycatch may be today's target species" and the term can be "inaccurate when used over an extended time to describe one element of a multi-species catch" (Murawski, 1992). It is also "inappropriate in terms of the reality of many multispecies fishing practices" (Alverson *et al*., 1994). This is particularly true for sharks, where the increased value of their products combined with declining stocks of traditional target species has made them an increasingly important component of the economic and food value of fisheries, thus shifting from a largely unwanted, discarded bycatch, to a by-product or joint catch. The contribution of 'bycatch' to overall shark mortality is, therefore, very important.

Alverson *et al*. (1994) list the following three definitions of bycatch:

i) species retained and sold (also termed 'by-product', or 'joint catch');

ii) species or sizes and sexes of species discarded as a result of economic, legal, or personal considerations (commonly used by scientists in fisheries of the Northeast and Western Pacific);

iii) the non-targeted species retained and sold, plus all discards.

The FAO FIGIS glossary (http://www.fao.org/fi/glossary/) provides the following definitions:

Bycatch: Part of a catch of a fishing unit taken incidentally in addition to the target species towards which fishing effort is directed. Some or all of it may be returned to the sea as discards, usually dead or dying. Discard: To release or return fish to the sea, dead or alive, whether or not such fish are brought fully on board a fishing vessel.

6. Although fisheries mortality has the single greatest effect upon world shark populations, some species can be affected by other factors, including pollution and debris, and the degradation and loss of habitats (for example, through land claim in coastal nursery grounds, dam construction on rivers, and damage by fishing gears).

7. Not all shark fishery products enter international trade. Many supply domestic markets or subsistence communities. It is difficult to determine the proportion that do enter international trade, not least because of inadequate taxon-specific monitoring of catches, discards (for definition see Box 1), landings and international trade. This leads to considerable differences between the total reported production of shark products, imports of shark products and exports of shark products. The difference between reported imports and exports is about 20,000 tonnes *per annum*, or 20 % of world trade. The discrepancy in reported trade data could, for example, be caused by the use of different commodity codes by different States. However, Customs systems often allow double counting of imports (i.e. imports and re-imports) and may reflect tendencies to under-report due to national tariffs; these factors are also likely to create discrepancies (Clarke, 2004).

8. There is, therefore, insufficient knowledge of the impact of international trade on shark populations and the contribution of international trade, rather than domestic consumption or bycatch, to overall mortality and hence to sustainability. In analysing available FAO data for sharks, it is evident that the data set is compromised by the poor quality of data provided to FAO and the lack of data provided by many shark catching and trading nations.

[3] *Exclusive Economic Zones*

9. Regardless, the most recent data analysis (Lack and Sant 2006) indicated that 20 States or entities contribute 80 % of reported global shark catch and that five of these States, (listed in descending order of reported catch levels: Indonesia, Taiwan (Province of China), India, Spain, and the United States of America) contribute 40 % of the reported total catch. The other 15 (also in descending order) are Pakistan, Argentina, Mexico, Malaysia, Japan, Thailand, France, Sri Lanka, the United Kingdom of Great Britain and Northern Ireland, New Zealand, Portugal, the Islamic Republic of Iran, Nigeria, Brazil and the Republic of Korea. When reported import and export data are considered, it appears that the most important trading States, in alphabetical order, include Brazil, Canada, Chile, China (including Hong Kong SAR and Taiwan (Province of China), Costa Rica, France, Indonesia, Italy, Japan, Mexico, New Zealand, Panama, Republic of Korea, Singapore, Spain, the United Kingdom and the United States of America (Lack and Sant, 2006). States that are not recording trade using Customs codes for sharks would not be identified by this analysis. The States listed in this paragraph are critical to the recording of accurate shark data, and can also make a significant contribution towards the sustainability of international trade.

10. Those data that are available indicate that, where sharks are taken in order to supply international trade demand, the main products are (probably in order of significance and economic importance), fins and meat, because most fisheries yield these products. Fins are nearly always retained, but meat is not. Fins comprise approximately 2 % of the whole weight of sharks, whereas meat comprises roughly 40 %. As a result, the total volume of shark meat entering international trade is greater than the volume of fins. But, the average economic value of shark fins vastly exceeds that of shark meat, and the number of sharks entering the fin trade is likely to exceed the number whose meat is traded. The Working Group noted that this warrants further study.

11. Many coastal shark fisheries utilize the whole carcass and yield a wide range of products. Fins are a by-product of several target fisheries – those for shark meat, particularly, and those for deep sea sharks (oil and meat fisheries). On the other hand, meat is a by-product of some shark fisheries that are primarily driven by the high value of fins in international trade (see case study below from the West African coastal shark fishery). As other fishery yields decrease, the demand for shark meat will continue to rise and meat products become more important drivers for shark fisheries.

12. Other products include liver oil, skin, cartilage, live fishes for the ornamental fish trade and public aquaria, curios and trophies, and traditional medicines. Case studies below provide examples. Non-consumptive uses include shark watching and diving.

Case studies

13. Specific cases where fin trade is having an effect upon sharks

Because fins are a high value low volume product and easier to handle and store than shark meat, some fisheries, often illegal, unregulated and unreported (IUU), target sharks in order to retain the fins and discard the meat. Several Regional Fishery Bodies (RFB) have recently adopted resolutions to ban this practice. IUU fishing is often unsustainable, and has major negative impacts on shark stocks and ecosystems generally, as well as on the implementation of management efforts that rely on accurate data collection. States that have a national finning[4] ban or related controls often find enforcement difficult or ineffective. For example, although Ecuador's regulations prohibit all shark fishing within the Galapagos Marine Reserve, it has proved extremely difficult to prevent illegal fin fishing. This is likely to be a widespread problem and suggests that there is need for a broader regional or international approach to this aspect of shark fishery management. Other shark fisheries may be driven primarily by the high value of fins in international trade, although other products are also retained. The following case studies summarize the scale of this trade through one importing entity and provide examples of fisheries influenced by trade demand for fins.

[4] 'Finning' is defined in fishery management fora as the removal and retention of fins from a shark and the discard at sea of the remainder of the carcass.

a) Hong Kong (SAR) shark fin trade

Studies of the shark fin trade in Hong Kong (SAR), the world's largest trading centre for fins, provide a means of characterizing the impact of this trade on shark populations. Import quantities until 2000 suggest that the trade grew by 5 % per year. Since that time China has acquired an increasingly larger proportion of the world trade but owing to changes in their commodity coding system, it is impossible to quantify trade levels accurately. The species composition of the Hong Kong SAR auction market consists of at least 17 % blue shark and only 14 species made up approximately 40 % of the market. Based on extrapolated auction data, the number of sharks represented in the global shark fin trade per year is estimated at approximately 40 million. Analogous estimates in biomass indicate that shark catches are three to four times higher than figures given in the FAO FISHSTAT Capture Production database for elasmobranches with tradable fins. Species-specific figures for the trade of blue shark fins were compared to stock assessment reference points and indicated that catch levels may be within sustainable limits for this species (Clarke, 2003). However, since the blue shark is one of the most prolific and resilient of shark species, these results cannot be used to make inferences about other shark species. The value of the global trade in shark fins is estimated at USD 400-550 million. Given the apparently close correlation between the volume of the shark fin trade and economic growth in China, the market is expected to continue to grow unless constrained by limits on supply, changing consumer tastes or other factors[5] (Clarke, 2003).

b) Shark finning[4] fishery in Indo-Pacific Ocean

A paper from Japan for the 9th Session of the Indian Ocean Tuna Commission (Anonymous, 2005) reported that 150-200 fishing vessels based in Taiwan (Province of China), flagged mainly in Taiwan (Province of China) and some in Indonesia, were currently operating shark finning[4] fisheries in the Western Indian Ocean. Some finned sharks year-round, others switched to shark fishing at the end of the tuna season. These fleets had moved from offshore Central America following declines in shark resources and increased regulation of shark fin landings in Costa Rica (Anon., 2005). Activities included illegal fishing in poorly patrolled EEZs. One vessel can catch up to 60 metric tons per month from previously unfished stocks, discarding the carcasses and retaining only the fins. The fins are trans-shipped to freezer carriers and transported to China [including Taiwan (Province of China)] for processing and marketing.

c) Illegal shark fin fishing in northern Australian waters

IUU fishing in northern Australian waters by foreign fishermen supplies the international fin trade, and has negative impacts on the sustainability of northern shark stocks and the regional ecosystem, including other protected marine species such as sea turtle and dugong. The demand for fins is so high, and prices so lucrative, that foreign fishermen are willing to risk incarceration by Australian authorities to catch sharks illegally for their fins within Australian waters (Julien Colomer, pers. comm.). Reductions in shark species abundance and diversity have been observed in several locations within northern Australian waters as a result (Dr Mark Meekan, pers. comm.).

d) Shark fishery development in West Africa

Sharks have been exploited by semi-industrial fisheries since the 1950s, with some target fisheries leading to stock collapse. Shark bycatch in small-scale fisheries has been salted, dried and exchanged for cereals with inshore regions. Ghanaian fishermen who settled in the Gambia in the early 1970s initiated a target shark fishery, exporting dried, salted or smoked shark meat to Ghana. They also purchased shark bycatch from other fisheries, leading to the first cash

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[4] *'Finning' is defined in fishery management fora as the removal and retention of fins from a shark and the discard at sea of the remainder of the carcass.*

[5] *It was the view of one Working Group participant that consumption and demand for shark fin products was not related to the economic climate. A new policy of the Chinese Ministry of Commerce was highlighted which has suspended the import and processing industry solely for re-export purposes, which includes shark fin processing in China, No. 55 Notification of 2004.). However, the case study provided here accurately reflects published information presented to the Working Group.*

fisheries in the region and increased levels of fishing effort. Shark products were imported from Senegal to Gambia then the meat re-exported to Ghana. Fin buyers had arrived in the region by the 1980s, leading to increased fishing effort targeting sharks and guitarfishes. Rapidly declining shark stocks resulted in a community-led shark fishing ban in Banc d'Arguin, Mauritania, in 2003. Fisheries continue in the other States of the Commission Sous-Régionale des Pêches (Subregional Fishery Commission), despite falling catches. These fisheries are driven by international fin trade to East Asia, but meat is also traded within the region. (Mika Diop[6], pers. comm.)

e) Costa Rican shark fin landings by foreign flagged fleets

Costa Rica initiated a programme to foster a longline fleet in 1982, to compensate for the depletion of coastal fishery resources. Currently, Costa Rica has the largest Pacific longline fleet of Latin America (550 vessels). Since 1998, foreign flagged vessels that target sharks in international waters are allowed to land products in private docks. Costa Rica passed a shark finning ban in February 2001 (AJDIP/47-2001), which mandated the landing of shark fins attached to the carcass. Throughout 2002 and 2003, violations of the regulation by foreign vessels landing solely shark fins at private docks were continuously exposed. The use of private docks by these vessels was challenged in Costa Rica's Constitutional Court in February of 2004, on the grounds that their use is contrary to local Customs regulations, which mandate the use of public docks for the importation of products by international flag vessels. The authorities replaced the aforementioned regulation with a new one in November of 2003 (AJDIP/415-2003), which allowed the landing of shark fins separated from the carcass, as long as the fin-to-carcass weight ratio did not exceed 12.7 %. In March of 2005, Costa Rica's new Fishery Law was passed, Article 40 of which mandates the landing of shark fins only if "attached to their respective carcass", thus eliminating the fin to body weight ratio system. Although the local fleet agrees and complies with the measure, international flag vessels opposed it. As a result, local fishery authorities decided to interpret the law in such a way as to allow the fins to be totally separated from the carcass at sea, yet tied back on to the carcass for landing. The Costa Rican General Attorney has ruled twice (July 2005 and January 2006) that the correct interpretation of Article 40 of the Fishery Law requires the fins to be landed attached to the carcass in natural form. Even though the resolutions of the Attorney are legally binding and mandatory, local fishery authorities refuse to comply. In February of 2006, Costa Rica's Constitutional court ruled that the fisheries and Customs authorities had failed to protect the constitutional rights of the Costa Rican people, and mandated both institutions to comply with Customs regulations.

f) Illegal shark fisheries in Ecuador

The Galapagos Marine Reserve Regulations prohibit all shark fishing, whether target or bycatch, and also prohibit transporting and trading in sharks or their products within or from the Archipelago (Reglamento de Pesca Artesanal de la RMG, Art. 69). These Regulations were ineffective. Illegal fishing targeting shark fins in order to supply the high value international trade is apparently increasing within the Marine Reserve, despite efforts to control it. The practice of finning seems to be limited within Ecuadorian waters to the Galapagos Archipelago, but all shark fin exports from Ecuador were subsequently prohibited by Decreto Ejecutivo 2130, Registro Oficial 437 of 7 October 2004. Shark fins obtained illegally in the Marine Reserve and legally in other coastal waters were formerly landed on the Ecuador mainland. These fins are now exported by boat to adjacent States because of the recent prohibition of shark fin exports. This regulation was enacted mainly in an attempt to control or eliminate the finning problem in the Galapagos Marine Reserve (Fowler, 2005). There is concern that these regulations have not been effective in restricting shark finning activities in Ecuador, but has merely increased the illegal fin trade that now passes through neighbouring States instead. It has therefore prevented accurate data collection. The newly adopted Shark Plan for Ecuador aims to address this issue.

[6] *Co-ordinator of the Subregional Fishery Commission of West Africa, covering Cape Verde, the Gambia, Guinea, Guinea-Bissau, Mauritania, Senegal and Sierra-Leone.*

14. Specific cases where meat trade is having an effect upon sharks

Shark meat is an important food resource for many coastal and inland communities and much is utilised only through domestic markets. Many coastal shark fisheries utilise the whole carcass and yield a wide range of products, with fins being a by-product of such fisheries. As other fisheries yields decrease, the demand for shark meat will continue to rise and is likely to become a more important driver for commercial shark fisheries. For example, blue shark landings from long-line fleets in several oceans have increased in recent years as the value of the meat has risen to USD 1,000/ton, partly as a result of the pressures of the regional fishery commissions to reduce tuna fish catches (Andres Domingo, pers. comm.). Other examples are presented below.

a) Industrial South American ray fisheries

In the past year, ray landings have increased in the South-West Atlantic Ocean. These captures are mainly exported to the Korean market. Statistics and Customs control records from this multi-species fishery list all species under a single category, therefore landings are not effectively monitored (Massa & Hozbor, 2003; Paesch & Domingo, 2003; Villwock de Miranda & Vooren, 2003; Andres Domingo, pers. comm.). In the north of Brazil, a recently described species (*Dasyatis colarensis*, previously referred to as *D. guttata*) is increasingly captured and exported for meat to the European Union. More data on this species' biology is required and this fishery must be monitored (Patricia Charvet-Almeida, pers. comm.).

b) Canadian porbeagle fishery

Beginning in the early 1990s, porbeagle sharks *Lamna nasus* were landed by a Canadian-directed longline fishery and bycatch in several other fisheries. Canadian landings prior to this time were reported only as bycatch (DFO, 2005). The majority of porbeagle landings are exported to the European Union Member States, which in turn is reported to export porbeagle to the United States of America, where the meat is consumed in restaurants (Vannuccini, 1999). A great deal of trade is also reported between European Union Member States, with the United Kingdon and Germany exporting porbeagle to France, Spain, and Italy importing from France.

c) European spiny dogfish meat demand

Demand for the meat from spiny dogfish, *Squalus acanthias*, particularly in Europe, is driving high-volume, international trade and unsustainable fishing in many parts of the world. The species has an exceptionally limited reproductive capacity owing to slow growth, late maturity (12-35 years), lengthy gestation (nearly two years), few offspring (18-24 months) and long life (up to 100 years). Fishing operations usually target mature females due to their large size. With the exception of New Zealand, fishery management programmes for spiny dogfish have been inadequate or completely lacking, leading to serious depletion of numerous populations. Ongoing market demand for shark meat has shifted fishing activities to stocks in the southern hemisphere and US Pacific, where new fisheries are allowed to develop despite the absence of population assessment or science-based management (Massa *et al*., 2002; Van der Molen *et al.,* 1998). Although less valuable than the meat, fins from spiny dogfish also enter international trade.

d) Deep-water shark fisheries in the Northeast Atlantic

Depletion of traditional shelf and pelagic fish stocks in the Northeast Atlantic has resulted in redirection of effort, particularly during the past decade, towards deeper water stocks. There is now increasing fishing effort focused on shelf-edge and slope fisheries. Several species of deep-water sharks are being taken in target fisheries and as an important utilized bycatch of fisheries for other species. Deep-water sharks have valuable meat and large oil-rich livers, which are the main products driving these fisheries. The shark fins are also utilized; these and probably the other products enter international trade. Fishery surveys have identified rapid and serious depletion of deep-water sharks, with declines of over 90 % reported for some stocks during the past decade (ICES, 2005). Recent scientific papers documenting deep-water sharks exhibit high longevity and late age of maturity, thus although no demographic analysis has been completed, evidence suggests these species are some of the least productive of the elasmobranches (Irvine, 2004; Irvine *et al*., 2006; Clarke *et al,*; 2002; Kiraly *et al*., 2005).

e) Ornamental fish trade

Examples include freshwater stingrays, leopard sharks, and the small colourful carpet and epaulette sharks collected in the Indo-Pacific.

f) Leopard sharks

In California, nearly all harvest of leopard sharks *Triakis semifasciata* are from recreational fishermen. Estimated recreational landings are about 138 ton per year from 1980 and 1995. Commercial landing have reached a high of 46 ton in but have been significantly curtailed owing to gill-net bans in California waters. Although current regulations and harvests do not appear to impact the California population of leopard sharks (Smith, 2005), in January 2006 six men were indicted by a federal grand jury with conspiracy to harvest thousands of undersized (under 36 inches in length) leopard sharks from the San Francisco Bay with the intent to sell them to the United States of America and international pet trade distributors (http://www.usdoj.gov/usao/can/press/html/2006_02_08_leopardshark.htm).

g) South American freshwater stingrays

South American freshwater stingrays (Potamotrygonidae) represent an important portion of the overall elasmobranches that are used for ornamental purposes. The most valuable freshwater stingrays in the aquarium trade are endemic species that are restricted to river basins subject to various impacts (mining, damming, deforestation, etc; see more detailed information in document AC20 Inf. 8). Specific regulation is needed to survey and manage these stingrays adequately, but until now a species quota-based system has only been implemented in Brazil. An effective neutral international export/import control is highly recommended to guarantee that the quantities of species exported are within sustainable fishing limits. Since the aquarium trade is concentrated on neonate and juvenile specimens, it is important to avoid catches of adults for consumption in areas or from populations that are already being exploited for ornamental purposes (Patricia Charvet-Almeida, pers. comm.)

15. Curios and trophies

Teeth, jaws and spines are sometimes used as decorative objects and large jaw sets as trophies (Fowler, 2004). Very large fins (primarily basking and whale sharks) are used for commercial display (Clarke, 2003). Sawfish (*Pristis* spp.) rostra are (sometimes illegally) taken as a curio item and enter international trade for decorative purposes (Charvet-Almeida, 2002; McDavitt & Charvet-Almeida 2004). The teeth of some species, such as the great white shark (*Carcharodon carcharias*), are very valuable. The curio trophy trade often involves threatened species, despite legal protection in some range States. CITES provisions for personal effects may potentially be used to circumvent controls on export of trophies and curios from listed species. Where the curio trade in products from threatened species results in unsustainable mortality of sharks and rays, there is a need to regulate this activity and to raise public awareness of the impacts of these products upon threatened stocks.

16. Other products

a) Health/Medicinal

Sawfish rostra (*Pristis* spp. saws) and rostra fragments are considered to help treat asthma and other chronic respiratory diseases (Charvet-Almeida, 2002). Shark fin soup and gill rakers from manta rays (Mobulids) are considered a health tonic. Cartilage is sometimes used to treat arthritis and related diseases or as a food supplement to provide calcium. In some States (e.g. Costa Rica) demand for cartilage during the mid 1990s stimulated a relatively short-term target fishery, with the products processed on shore prior to export. Cartilage is now mainly a by-product of fisheries for meat. The effectiveness of cartilage treatment requires investigation. Public awareness could help reduce threats from medicinal use.

b) Liver oil

This has been derived in large quantities from fisheries for basking shark (*Cetorhinus maximus*), whale shark (*Rhincodon typus*), tope (*Galeorhinus galeus*), spiny dogfish (*Squalus acanthias*), and a large number of deep-sea sharks. Natural shark oil has now partly been replaced by synthetic products and market demand has increased for the meat from many of these species.

c) Skin

Shark skin is used for the manufacture of boots and belts in Mexico. There is an expanding Southeast Asian industry for the manufacture of bags, wallets, watchstraps and other products from ray skin, many of which enter international trade. The number and identity of species involved in this industry is uncertain and some undescribed species may be utilized. In some cases, however, the skin may be a by-product of meat fisheries.

d) Miscellaneous

From the mid 1970s until today, sawfish rostral teeth have been the preferred material used to manufacture artificial 'spurs' for use as weapons in Peruvian cock fighting. The rostral teeth are mostly obtained from Brazil, Ecuador, Panama and various Caribbean countries. Depending on the species used, and assuming all rostral teeth in the saw are usable, one rostrum could now have a retail value of between USD 2,114 and USD 6,984 (Matthew T. McDavitt, pers. comm.)

Conclusions/recommendations

Relative importance of international trade as a source of shark mortality

17. The working group found it difficult to determine the relative importance of international trade as a driving force for shark population mortality and declines, compared with domestic use and discarded bycatch. Nevertheless, there was broad acknowledgement that significant quantities of shark and ray products do enter international trade. Although this is largely unmonitored internationally, Hong Kong SAR's excellent Customs data quantify the trade through this single market. There are also some fisheries that are wholly or partially driven by international trade demand (Indian Ocean Tuna Commssion example, West Africa or freshwater rays), while other fisheries only supply domestic markets or subsistence uses.

18. This question cannot be answered until greatly improved data become available on fishery mortality (catches, landings and discards), domestic market consumption and international trade data (both exports and imports). Poor fishery management, monitoring and the continuation of IUU fishing where good management occurs will have to be addressed for this to be possible.

19. The working group also noted that it would be desirable to consider and evaluate the cumulative impacts of the varied threats to shark populations, but that this is currently unlikely to be possible for the majority of stocks.

Improving data collection and analysis

20. Efforts should focus on improving data collection on the five to 20 States that contribute 40 to 80 % of the total shark catch (according to FAO data presented in Lack and Sant, 2006). Improved catch, bycatch, discards market and trade data from these States would hugely increase knowledge of the contribution of their fisheries to international trade.

21. Improved data collection and analysis by Regional Fishery Bodies and their Contracting and Cooperating Parties can also contribute significantly to this end. It is recognized that there was also a recent recommendation of the expert consultation to review implementation the IPOA-Sharks in December 2005 to involve RFBs in improving international shark management (FAO, in preparation, 2006).

22. States reporting the highest proportion of international trade in shark products are China [particularly Hong Kong SAR and Taiwan (Province of China)], Spain and other European Union Member States,

Mexico, the Republic of Korea, Japan, New Zealand and the United States of America,. Action by these entities is critical to the recording of accurate shark data by species and by product. These countries have close relations with the World Customs Organization (WCO).

23. The Working Group made the following recommendations:

    a) An assessment of the catch reporting arrangements and trade codes for shark products for the 'top 20' shark fishing and trading States and entities, and Regional Fishery Bodies (RFBs).

    b) Analysis of shark catch, production and markets in key catching and trading countries.

    c) Comparison and analysis of export and import data for the key trading States identified by TRAFFIC's paper to the Working Group. Cooperation, expertise and assistance from FAO and RFBs would be welcomed by developing countries.

Fishery management priorities

24. CITES should continue to monitor implementation of the IPOA-Sharks and practical improvements in shark fisheries monitoring and management to ensure that this subject remains a high priority for global fishery activity. As a matter of urgency, if progress towards sustainable fisheries and trade is to be maintained, Parties and RFB, in collaboration with FAO, should develop a five-year implementation programme with specific targets for data collection and management action by key fishing and trading States and other entities.

25. The working group considered a range of different management techniques, including finning bans, catch quotas and other traditional fishery management measures, and temporal or permanent protected areas. Fishery management can be complemented by biodiversity and trade management measures; all appropriate management tools should be applied to the sustainable management of those particularly vulnerable (for example K-strategists) shark species[7].

26. The role of National Shark Plans and the FAO IPOA–Sharks was considered. The latter had been the main subject of discussion at the FAO Expert Consultation in December 2005 (FAO, in prep., 2006). Implementation is patchy and several participants were of the view that it was 'slipping off' relevant national and international agendas, but that meeting had concluded that the IPOA–Sharks was a beneficial endeavour and that efforts to improve its effectiveness should be strengthened. Some States have Shark Plans but no management measures. A few (e.g. Canada and New Zealand) have shark fishery management in place but no Shark Plans. Some more progress has since been achieved since the review of IPOA–Sharks implementation presented in document CoP13 Doc. 35.

27. The Working Group concurred with FAO's view that monitoring and data collection initiatives will likely be the single most important measure for capacity-building in most shark fishing and trading States.

Respective roles of FAO, Regional Fishery Bodies and CITES

28. The Working Group considered how CITES might contribute to encouraging or implementing elements of the sustainable management measures for shark fisheries supplying international trade that are the responsibility of national fishery departments, FAO and RFBs. This might, for example, be achieved through non-detriment findings for listed species and CITES trade regulation remit. The Working Group reiterated the message from many CITES and FAO meetings: that it is important to improve communication between fishery departments and CITES authorities. This process may be aided at national level by the listing of the same sharks on the CITES Appendices and CMS (Convention on Migratory Species) should also help improve communication at the national level. These Conventions may also be able to liaise at the regional and international levels to promote collaboration with FAO and RFBs.

Discards

[7] *One Working Group participant noted the difficulty in establishing and implementing such management measures.*

29. Discards (undesirable bycatch that is subsequently discarded into the sea) make a significant contribution to shark mortality. Levels of discard *versus* retention of bycatch, and efforts to mitigate, manage or avoid discards may depend upon operational circumstances and varying levels of demand for products (see Box 1).

30. FAO catch data do not include catches discarded at sea. There is a need to estimate the quantities or proportions of sharks that are discarded and their estimated chances of survival in major fisheries and sea areas, in order to estimate total shark mortality arising from discards. Such analyses should, where possible, be undertaken at species level as well as for different sea areas and fisheries.

Consumer markets

31. The Working Group noted that, while the education of the public and public awareness campaigns in consumer markets could have a very important impact upon international trade demand for shark products, this was outside CITES' remit.

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