**Update on progress made by the IUCN Species Survival Commission's Shark Specialist Group in assessing the threatened status of sharks and related taxa**

Information Document for the 20TH Meeting of the CITES Animals Committee

## 1. Introduction

CITES Resolution Conf. 12.6 on the conservation and management of sharks refers to the conservation status of shark species as follows:

> *NOTING that IUCN – The World Conservation Union's Red List of Threatened Species (2000) lists 79 shark taxa (from the 10 per cent of taxa for which Red List assessments have been made);*

It also charges the Animals Committee with the following species-specific actions:

> *DIRECTS the Animals Committee to examine information provided by range States in shark assessment reports and other available relevant documents, with a view to identifying key species and examining these for consideration and possible listing under CITES;*
>
> *DIRECTS the Animals Committee to make species-specific recommendations at the 13th meeting and subsequent meetings of the Conference of the Parties if necessary on improving the conservation status of sharks and the regulation of international trade in these species;*

This Information Document updates AC19 Inf. 7, summarising the work undertaken by the IUCN SSC Shark Specialist Group[1] (SSG) regarding Red List[2] assessments of sharks and related species[3]. Significant progress has been made since the 12th Conference of Parties towards assessing the threatened status of this group, although the detailed review is still underway. The aim is to complete, by consultation and consensus within the SSG, Red List assessments for as many as possible of the ~1,000 species for publication in IUCN's major 2004 review of the Red List. In the interim, the 2003 Red List of Threatened Species lists over 250 taxa as a result of work undertaken between 2000 and 2003 (Table 1 and Annex 1). The listing process will establish a valuable baseline for monitoring improvements in our knowledge of particular taxa, and changes in the overall conservation and management status of the group. Given that the standardised forms used for recording Red List assessments have a section specifically for trade, it is possible where information is available to use these assessments to highlight those species that enter trade and for which trade is of concern.

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[1] The SSG is the Red List Authority for chondrichthyan assessments (appointed by the IUCN Species Survival Commission through Co-Chairs Sarah Fowler and Jack Musick) and considers full and open consultation with its membership to be essential for the preparation of accurate Red List assessments.

[2] The *IUCN Red List of Threatened Species™* is widely recognised as the most comprehensive source of information on the global conservation status of plant and animal species. Red Lists are among the most widely used tools available to conservationists worldwide for focusing attention on species of conservation concern. They enable management priorities to be targeted and may be used to monitor the long-term success of management and conservation initiatives. The assessments evaluate the conservation status of individual species, identify threatening processes affecting them and, if necessary, propose recovery objectives for their populations. Where entire taxonomic groups are assessed, the assessments can be used as a tool for measuring and monitoring changes in the overall status and knowledge of those taxa.

[3] The term 'sharks' is generally used throughout this document to refer to the chondrichthyan fishes, which comprise elasmobranchs (sharks and batoids; batoids include the skates and rays) and holocephalans (chimaeras, ghost sharks and rabbit fishes).

## 2. Results

Assessments for 262 chondrichthyans had been undertaken at the time of the 2003 Red List launch (www.redlist.org). Fifty-six species (21%) are Threatened (Critically Endangered, Endangered or Vulnerable), and 64 (24%) Near Threatened. An additional 38 stocks are Threatened or Near Threatened regionally. Sixty-four species are globally Data Deficient, meaning that inadequate information is available to make an assessment of their threatened status. Reviews of the assessments undertaken to date indicate that many of the taxa at highest extinction risk also enter international trade, including some species of deepsea sharks, species restricted to freshwater habitats, and coastal endemics whose entire range is subjected to intensive fisheries. Selected examples are detailed below, but this list is not comprehensive and readers are encouraged to visit the Red List website for further details.

**Table 1. A summary of global assessments for chondrichthyans on the 2003 Red List.**

| *Category* | *Sharks* | *Batoids* | *Holocephalans* | *Total* | *Percentage* |
|---|---|---|---|---|---|
| Critically Endangered | 5 | 3 | 0 | **8** | **3%** |
| Endangered | 4 | 13 | 0 | **17** | **6.5%** |
| Vulnerable | 21 | 11 | 0 | **31** | **12%** |
| Near Threatened | 56 | 8 | 0 | **64** | **24%** |
| Least Concern | 65 | 9 | 3 | **77** | **29%** |
| Data Deficient | 51 | 12 | 1 | **64** | **24%** |
| Conservation Dependent | 1 | 0 | 0 | **1** | **0.5%** |
| Totals | **203** | **56** | **4** | **262** | |

### 2.1. Red List Progress Update

The SSG has a series of regional Red List workshops underway. These provide training in the Red List assessment process, facilitate detailed discussions on the status of species by local and international experts, assess the status of chondrichthyan fishes within the regions, identify species of conservation concern, and help develop priorities for future work. Assessments developed and agreed by consensus of the experts represented are then circulated by email post-workshop to all other members of the SSG, prior to submission to the IUCN Red List, ensuring consensus on all listings. To date, the results of only the first of the five workshops held in 2003 have been reviewed and published (Australia and Oceania). The results of the other workshops are currently under review prior to inclusion in the 2004 Red List, thus only preliminary results can be presented here.

*Australasia and Oceania workshop, March 2003*

This SSG region includes the EEZs and adjacent waters of Australia, New Zealand, New Guinea (Papua New Guinea and Indonesian Irian Jaya) and many smaller Pacific island nations. The chondrichthyan fauna of this area is particularly diverse, with ~350 (approximately one third) of all known species occurring in this region, and a high level of endemism. The threatened status of 177 species were assessed at this workshop and are now included in the 2003 Red List. Of these, globally, 34 species were classified as Threatened: four Critically Endangered, six Endangered and 24 Vulnerable. There is a range of fisheries targeted at sharks within the region, primarily for their flesh, which is consumed locally, but also for their fins, cartilage, liver oil and skins. A broad range of other fisheries take them as bycatch (including a bycatch of freshwater species in some areas), from which products also enter trade. Threatened species in trade include the **School Shark *Galeorhinus galeus***, species of **Deepsea Dogfishes** (detailed in examples below) and several species of **Carcharhinids**. New Zealand exports much of its shark products, whereas much of Australia's catches are utilized domestically (FAO 2002). Although neither country reported any production or trade in shark fins to FAO in 1998-2000, both appear in the Hong Kong shark fin import database (Clarke *et al*. in press). The exploitation and trade of sharks by other countries within the region are poorly documented, but it is known that the increased demand for fins in Asian markets has resulted in increased exploitation in many of the Pacific nations, including the

extensive coral reef environments. Large-scale pelagic fisheries also exist in both the Pacific and Indian Ocean segments of this region. Compared with most other countries, some of Australia and New Zealand's shark populations are among the best managed and well studied in the world. Australia is one of the few nations with a Shark Assessment Report (SAR) and a National Plan of Action for Sharks (NPOA). Indeed, several species that are of considerable conservation concern elsewhere in their range are assessed as Least Concern in Australia and New Zealand, however, there have also been some serious depletions among some bycatch and target species. For details, a PDF of the workshop report (Cavanagh *et al*. 2003) is available via the SSG website.

*South American Workshop, June 2003*

This workshop was attended by regional experts from Brazil, Chile, Argentina, Peru and Uruguay, together with international experts. The region is another important centre of chondrichthyan biodiversity, with >300 species, including many endemics. Approximately a third of these were assessed during the workshop, and additional assessments are currently underway. Limited data are available for the region, but we now have a preliminary baseline, which will be subject to further review. Preliminary results indicate 15% of those assessed are Threatened at a global level, with a further 50% Threatened regionally. There are some directed fisheries for sharks in this region, but most are taken as bycatch from other fisheries, although they are frequently landed and utilised. Some longline vessels for pelagic teleost fish now also target sharks due to the increasing value of fins (Domingo 2002). Several countries in the region export shark products and local consumption is fairly high. Preliminary indications from the assessments at this workshop show that species of particular concern and traded include endemics to the region, such as **Smooth-hound sharks**, e.g. ***Mustelus schmitti*** (Vulnerable in Brazil) and ***M. fasciatus*** (Critically Endangered). In Argentina, ***Mustelus*** spp. are popular food-fish locally, and exports go to Japan, Korea, and Australia. The Critically Endangered **Brazilian guitarfish *Rhinobatos horkelii***, was formerly abundant in southern Brazil, where it represented the only economically-important member of the Rajiformes caught in the area. Abundance fell by 96% in a decade of intense gillnet fishing. **Freshwater Stingrays** enter the international ornamental fish trade (see below), and some of these species are restricted to a single river system within a larger river basin. ***G. galeus*** is an Endangered species in targeted fisheries here, utilised locally and exported to Europe and Australia, and others, including threatened species of **Angel Sharks** e.g. ***Squatina guggenheim***, and some ray species are exported to Asia and Europe. Argentina exports several hundred tonnes of **Spiny Dogfish *Squalus acanthias*** to Europe each year. Fins from Brazil, Uruguay and Argentina are noted in Hong Kong records (Anon 2001). With the exception of the Falkland Islands skate and ray fishery, there are no management plans in place for sharks in the region, although Brazil has a plan drafted by members of the Sociedade Brasileira para o Estudo de Elasmobranquios (SBEEL). The results of this workshop will be published on the SSG website in June 2004.

*Southern African Workshop, September 2003*

Participants attended this workshop from South Africa, Namibia, Madagascar, Tanzania, Kenya, Mozambique, Angola, Mauritania, USA and UK. African waters support ~ 25% of the world's chondrichthyan species. The high endemicity of the fauna, coupled with virtually no fisheries regulation outside South Africa and Namibia, accelerating fisheries and other marine activities by humans, and localized marine habitat degradation, calls for considerable urgency in addressing the sustainable exploitation and conservation of chondrichthyans of this region. There are domestic and regional, as well as international, markets in Africa for shark meat, cartilage, skin, liver oil and fins (Barnett 1997). Dried and salted shark meat is common with substantial markets in Kenya and Tanzania. Approximately 120 species were assessed at this workshop, and enormous gaps were revealed in the knowledge of population status, trends in shark stocks, species in trade, etc, with many species assessed as Data Deficient despite serious concerns that many of them are likely to be threatened. This region is one of the least known areas in terms of biodiversity and conservation status of sharks and rays; much work is needed to address this.

*Mediterranean Workshop, October 2003*

There are approximately 86 species of chondrichthyans in the Mediterranean Sea and a general declining trend throughout the region in their abundance and range, possibly a worse situation than in most regions since this is a semi-closed sea with intense fishing activity all around its coasts and offshore. Experts attended from nine Mediterranean countries, together with international experts. Preliminary results from this workshop indicate that almost half of the species assessed are Critically Endangered, Endangered or Vulnerable, and 30% are Data Deficient, with one of the main problems, again, being the bycatch issue. There is a strong demand for shark meat, and some of the countries in this region are among the biggest exporters of shark fins to Asia, (Clarke *et al*. in press). Highly threatened species include the **Common Skate *Dipturus batis***. This once common species, extremely vulnerable to trawl fisheries, has virtually disappeared from the region. Other species of concern include **Angel Sharks**, ***Squatina aculeate***, ***S. oculata*** and ***S. squatina***, and Guitarfishes ***Rhinobatos cemiculus*** and ***R.rhinobatos***.

*Deep Sea Chondrichthyan Workshop, November 2003*

Nearly 35% of chondrichthyans are confined to the deepsea environment and are generally more vulnerable than coastal and epipelagic oceanic species, due to their even slower growth and reproductive rates, lower biomass and the limited productivity and geographic constraints of deepsea environments. Most are taken as bycatch in other fisheries. However, there are some important target fisheries, some of which are driven by international demand for their products (particularly liver oil), with some species that were previously discarded now readily landed for human consumption. Case studies presented at the workshop illustrated that even small numbers of vessels operating target fisheries on deepsea sharks can seriously deplete stocks in only a few years of fishing (see examples in section below). Data is sparse as landings rarely detail species composition. Many species still have taxonomic problems, complicating the collection of data, and some genera e.g ***Apristurus*** and ***Centrophorus*** are currently under revision (Fowler 2003).

## 2.2. Threatened Species and Trade

Products in trade from sharks and their relatives include meat and fins for consumption; skins; liver oil to produce lubricants, cosmetics and vitamin A; live specimens for aquaria; teeth and jaws sold as tourist curios; and cartilage as a purported treatment for cancer and other ailments. Global statistics on the production of particular products such as meat, fins and liver oil are available, but owing to sparse data, the large number of species and size of animals involved and the potential for double counting, conversions to numbers or biomass of sharks are problematic. Produced quantities of less valuable products, such as skins, cartilage, jaws, fish meal and fertilizer, are rarely tabulated by trade authorities and are thus even more difficult to assess (Clarke *et al*. in press). The following section provides examples from the Red List assessments of some Threatened and Near Threatened species in trade for particular products. *Note, many of these species are also in trade for other products, for example, the fins of species mentioned below as traded for meat, are also likely to be in trade. Products for which they are most valued are the focus here.*

### ***Examples***

#### 2.2.1 Meat

The most expensive shark meat is reported to be **Spiny Dogfish *S. acanthias*** at $9.91 US/kg in Italy (Vannuccini 1999): assessed as Endangered in the Northeast Atlantic, Vulnerable in the Northwest Atlantic and Near Threatened globally, with a review currently underway by members of the IUCN SSG. The government of Germany has circulated a draft CITES Appendix II listing proposal for this species for consultation with EU range states, in recognition *inter alia* of the importance of international trade in driving unsustainable fisheries for this species.

According to FAO sources, other species with valuable meat include:

**Whale Shark *Rhincodon typus.*** Retail prices quoted in Taiwan markets were reported to be commonly $11.8 US/kg, ranging up to $17.2 US/kg (Chen and Phipps 2002), indicating that whale shark meat can be as, or more, expensive than spiny dogfish. Listed on CITES Appendix II (but reservations taken out include major fishing and trading states and will limit data collection), and Vulnerable on the Red List. Populations depleted due to harpoon fisheries in several countries, together with incidental capture in other fisheries.

**Shortfin Mako *Isurus oxyrinchus***. Near Threatened: subject to significant bycatch and targeted fisheries; most catches are inadequately or unrecorded; low reproductive capacity. Global review due in 2004.

**Common Thresher *Alopias vulpinus***. Near Threatened in California and globally Data Deficient due to inadequate data elsewhere. Global review to take place in 2004. The California drift net fishery provides strong evidence that this biologically vulnerable species is highly susceptible to overfishing in a short period of time. The population is showing signs of recovery under management, but it is likely that subpopulations in unmanaged fisheries in other parts of the world are more seriously at risk.

**Porbeagle *Lamna nasus*.** Currently listed as Near Threatened globally and Vulnerable in the Northeast Atlantic, but a review underway indicates this species is likely to be uplisted, possibly to Critically Endangered in the Northeast Atlantic and Endangered in the Northwest Atlantic. According to SGRST (2002), this is one of the most biologically vulnerable species to exploitation. Serious declines have been documented in the catch from target and incidental fisheries. The government of Germany has circulated a draft CITES Appendix II listing proposal for this species for consultation with EU range states, in recognition *inter alia* of the importance of international trade in driving unsustainable fisheries for this species.

**School (tope or soupfin) Shark *Galeorhinus galeus***. The Red List assessment (currently under review) lists this species as Endangered (South America), Vulnerable (southern Australia), and Near Threatened (New Zealand and southern Africa). Particularly low biological productivity, easily caught by many fishing methods, and demonstrates how such a species can be severely depleted if not adequately managed.

Also worthy of particular mention here are **Deepsea Dogfishes: *Centrophorus*** species, marketed for their meat and liver oil (Daley *et al*. 2002). Two species ***Centrophorus harrissoni***, an Australian endemic and ***Centrophorus uyato*** are Critically Endangered in Australia, (the latter is Data Deficient globally due to taxonomic uncertainty). These species have undergone drastic declines of over 99% and 95% respectively in recent years due to commercial fishing activities (Graham *et al*. 2001). In Australia there are currently no catch regulations for mid-slope dogfishes, and fishers are now targeting dogfishes to supplement their income outside the quota system, with the meat and liver oil of at least 11 species being marketed (Irvine *et al*. 2003). Elsewhere, similar species are likely equally, if not more threatened, eg, ***Centrophorus granulosus*** in the Northeast Atlantic and Northwest Pacific. For many of the deepsea species, the category Data Deficient was assigned due to lack of information, despite concerns that they are among the most vulnerable of species to depletion.

### 2.2.2. Fins

Shark fins are among the most expensive of seafood products and retail at US$4.25-$744 per kg (Clarke 2002). Highly desirable species are known to include **Guitarfishes** or **Shovelnose Rays**, **Sawfishes** and **Hammerhead sharks**. According to traders, a given fin's value is a function of not only the species of shark, but also the fin position, size and cut (Fong and Anderson 2000). In addition to traditional target fisheries for **Guitarfishes** and other coastal sharks, much of the world's shark fin production, particularly since the late 1980s/early 1990s, has been generated by pelagic longline fisheries for tuna and swordfish. These fisheries take a large bycatch of pelagic sharks, particularly **Carcharhinids** (which are also listed as highly migratory and straddling stocks in the UN Convention of the Law of the Sea, but not yet the subject of management as required

under the UN Fish Stocks Agreement). For the most part, data on these catches suffers from a lack of species specificity and from under-reporting. It was estimated that at least 32% of the fins traded through Hong Kong (the world's biggest market) are derived from **Carcharhinids** (estimated for **Blue *Prionace glauca*, Silky *Carcharhinus falciformis*, Dusky *C. obscurus*, Sandbar *C. plumbeus*, Bull *C. leucas*** and **Oceanic Whitetip *C. longimanus* sharks**) (Clarke 2003). Where data are available for longline bycatch of sharks, some serious stock depletions have been reported, including depletion of over 99% in **Oceanic Whitetips** and 90% in **Silky Sharks**, in the Gulf of Mexico between the 1950s and 1990s, where these species were formerly the most commonly caught shark species (Baum and Myers 2004). **Scalloped Hammerhead *Sphyrna lewini***, **White *Carcharodon carcharias*** and **Thresher *Alopias spp.* sharks** are all estimated by Baum *et al*. 2003 to have declined by over 75% in the past 15 years in the Northwest Atlantic.

Some examples derived from the Red List assessments are provided here.

**Basking Shark *Cetorhinus maximus***. Listed on CITES Appendix II (but reservations taken out include major fishing and trading states and will limit data collection), and on the Red List globally Vulnerable, Endangered in the Northeast Atlantic and North Pacific. Fins valuable, including for display due to their impressive large size. Documented fisheries in several regions have usually been characterised by rapidly declining local populations as a result of short-term fisheries exploitation, followed by very slow or no recorded population recovery.

**Guitarfishes: Rhinidae and Rhynchobatidae species.** Several species have been assessed as Threatened (Vulnerable, Endangered and Critically Endangered). These biologically vulnerable species are captured by multiple artisanal and commercial fisheries as both target and bycatch. The fins from large animals fetch exceptionally high prices, being among the most highly valued fins in the world. Evidence of local population depletions where target gillnetting has occurred. Level of exploitation remains high.

**Sawfishes: Pristidae.** All sawfish have recently been upgraded to Critically Endangered (this information will appear on the 2004 Red List). The fins are very highly priced, some also have valuable meat, and their sawtoothed rostra or snouts are of high value as curios. Their restricted range, biological vulnerability and high susceptibility to capture in nets has resulted in serious population declines around the world (Camhi *et al*. 1998).

### 2.2.3 Curios: teeth, jaws, rostra, etc

Jaws and teeth are traded as curios. **Sawfish** rostra (see above) are highly valued in some parts of the world, traded as curios and for traditional medicine.

**White Shark *Carcharodon carcharias***. Vulnerable (globally), but thought to be more threatened in certain region, review underway, e.g. Mediterranean population may be Critically Endangered. Jaws, teeth and fins are high value, low volume products in considerable international demand as trophies or curios (the jaws and teeth are readily available through internet sites for up to US$425/tooth and US$12,500/jaw set). Australia's CITES Appendix III listing for this species has resulted in five international trade records for 2002. There is also evidence of illegal trade in these products. A separate Information Document has been submitted summarising the conservation and management status of this species.

### 2.2.4 Liver oil

In the 1930s and 1940s, the use of shark liver oil as a lubricant and source of vitamin A prompted a boom in fisheries for the **School Shark (tope/soupfin) *G. galeus***, the **Spiny Dogfish *S. acanthias*** and **Basking Shark *C. maximus*** (see above for threatened status). Although the oil is still used in the manufacture of cosmetic and pharmaceutical products, no production has been reported since 1997, although Norway and Korea have both continued to report liver oil trade (FAO 2002) and ongoing production of liver oil is known to be occurring in some regions (Clarke *et al*. in

press). Liver oil from **Deepsea Dogfish *Centrophorus* species** (see above) is marketed in Australia (Daley *et al*. 2002).

2.2.5 Skins

There are few statistics available on trade in shark skin. In the past, major processors of shark skin were the US, Mexico, Venezuela, Germany, the UK and Japan (Vannuccini 1999).

**Manta Ray *Manta birostris*.** Data Deficient globally due to lack of quantitative date, however where information is available, the species is listed as Vulnerable (Gulf of California, Mexico, South China and Sulu Seas). A global review will be undertaken in 2004. A single manta in Indonesia sells for approximately $160 for the meat, skin, and gill rakers (H. Dewar pers. comm, 2002). There also are or have been target fisheries for mantas and other mobulid rays in Baja California, Philippines and West Africa.

2.2.6 Live trade

Sharks and rays are being increasingly targeted for the public and private aquarium trade. This is of concern for threatened species, particularly those with restricted distributions and small population numbers (Camhi *et al*. 1998).

**Amazonia Freshwater Stingrays Potamotrygonidae species.** Members of this group of endemic rays are currently listed as Data Deficient due to sparse information, however, a review is underway, with assessments in preparation. The trade in live specimens of these attractive and valuable rays is regulated by Brazilian legislation but there is evidence of some protected species appearing in aquariums in Europe.

### 2.3. Workshops planned in 2004

Planning is underway for a workshop to assess the threatened status of batoids of the world, to be held in South Africa, September. This will focus on those species not yet assessed during regional workshops. A workshop is planned in USA, for June 2004, to focus on the shark species of Central and North America, including the Caribbean.

*Funding still required*

The major regions for which funds have not yet been identified and for which workshop planning is, therefore, not yet underway are West Africa, Northern Indian Ocean, East Asia and Northwest Pacific.

## 3. Conclusions

It is clear the Red List process is invaluable for drawing together biological factors and threats in order to make overall assessments of the threatened status of individual species of sharks, thus contributing towards the implementation of the UN FAO International Plan of Action for the Conservation and Management of Sharks as well as to activities of Parties and the Animals Committee under Resolution Conf. 12.6.

It is also apparent that our knowledge of the status of most of the known species of chondrichthyan fishes is still seriously limited. Lack of basic understanding of stock structures, the poor quality and lack of species-specificity of recorded data in many regions, and the uncertainty surrounding the sustainability of current levels of fishing (mostly unmanaged) are all issues that remain in urgent need of attention, as identified in previous reviews by FAO and by CITES. As demand for fins, meat, cartilage and other products continues to increase, these Red List assessments highlight widespread concern over continued, if not increased shark fishing pressure, at least partly driven by international trade demand for their products.

Many of the assessments have highlighted concern for species caught as bycatch. In a mixed-species fishery, less-abundant species could be driven to extinction while numerically dominant, more resilient species continue to support the fishery (Musick 1999). Continued research and monitoring on the bycatch of sharks in non-target fisheries is as important as for those taken in target fisheries.

The SSG plan a detailed review of threatened species in trade, and will regularly prepare a summary table for reference and to inform implementation of Resolution Conf. 12.6 (particularly the identification of key species) by the CITES Animals Committee and the Conference of Parties. In addition, Red List assessments will continually be updated as new information is obtained. All additions and revisions will be incorporated in the Red List database. For this reason, readers are urged always to consult the current Red List (www.redlist.org), updated every year, to obtain the most up to date assessments.

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