

SHARK NEWS

SHARK NEWS 8 NEWSLETTER OF THE IUCN SHARK SPECIALIST GROUP DECEMBER 1996

Sharks and CITES – latest news

It is over a year since *Shark News* (5:4) reported on progress with the implementation of the Shark Resolution (Conf. 9.17, Trade in Sharks and Shark Products), adopted at the 9th Conference of the Parties (CoP) to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in November 1994. This Resolution arose as a result of the reported steady increase in the international trade in shark products (particularly fins, but also cartilage, meat, teeth, jaws, skin and oil); the concern that many species were being heavily exploited by fisheries, some at unsustainable levels; and because there are no multinational or regional agreements for the management of such shark fisheries or international trade (indeed, only four countries world-wide have domestic shark management plans). Moreover, adequate monitoring of fisheries and trade is also lacking.

The Shark Resolution therefore directed the Animals Committee to compile and review existing data on the biological and trade status of shark species subject to international trade, and to prepare a discussion paper on these data prior to the 10th CITES Conference in June 1997, in Zimbabwe. It also requested FAO and other international fisheries management organisations to establish programmes to provide biological and trade data (in time for the 11th CoP), and all nations utilising and trading in sharks to cooperate with these organisations and assist developing States in the collection of species-specific data.

Thirteenth meeting of the CITES Animals Committee

Existing data on the biological and trade status of sharks have been compiled by a number of organisations, to assist the CITES Animals Committee with the preparation of its discussion paper. This material was presented to the Committee at its 13th meeting, held in Pruhonice, Czech Republic, 23–27 September 1996, in the form of three summary reports:

- a discussion paper by the US National Marine Fisheries Service on shark status and fisheries world-wide;
- a report by the World Conservation Union (IUCN) Shark Specialist Group on the biology and conservation status of sharks and their implications for exploitation and management, including a list of species of particular concern; and
- a summary report by the TRAFFIC Network on their global overview of the utilisation of and trade in sharks and related

species. (The full report of 18 month TRAFFIC study is being published in December 1996 – see page 6.)

These reports all highlight the vulnerability of sharks to overfishing (as a result of their slow growth, late maturity, and low reproductive capacity), and emphasise the significant lack of information on shark fisheries, biological status, or trade. They recommend enhanced species-specific data collection to improve our knowledge of the biology of these species, the scale of fisheries landings and bycatch, and the levels of international trade in sharks. Such data are required in order for the implementation of sound management of shark populations. It was also noted that the Shark Resolution should cover the closely related rays and chimaeras, which have the same general biology and are subject to the same unregulated fishing pressures.

Additional information was provided by Japan (on the status of pelagic sharks in the Pacific Ocean), the Food and Agriculture Organisation (FAO, describing activities towards supporting the CITES Resolution – see page 7), the International Commission for the

Conservation of Atlantic Tunas (ICCAT) and the Latin American Fisheries Development Organization (OLDEPESCA) (see next page).

A document is also in preparation by the Center for Marine Conservation, in cooperation with TRAFFIC. This reviews the scope and potential of existing international agreements and conventions relevant to management and trade in sharks. It will be released in early 1997, and was not available for the meeting.



Sawfish *Pristis zijsron* saw (left) and fins (top right) in shop window, Sandakan, Sabah. The dried fins are priced at RM1,000 (about US\$400); the 4–5 foot saw is 'not for sale'. CITES Appendix 1 listing might prohibit export, but not domestic trade. Photo: Sarah Fowler.



Also in this issue ...

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Costa Rica's shark cartilage industry
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Preparation of report to the 10th CITES meeting

The Chairman of the Animals Committee is currently preparing a summary report for CoP 10 incorporating biological and trade information presented to the Committee since CoP 9. A small drafting group was formed to assist in preparation of this document, comprised of individuals representing Panama, the United States, Japan, FAO, ICCAT, OLDEPESCA, Central American Fisheries Organization (OSPESCA), TRAFFIC and IUCN. The report will base its conclusions and recommendations on those in the working documents from the US, TRAFFIC, IUCN and FAO.

The first draft was considered by the drafting group in early November. A revised draft will be circulated to Mexico, Singapore, Republic of Korea, Netherlands, Germany and members of the Animals Committee, for finalising in December. The final report will be submitted to the Parties (currently 132 countries) at the 10th Conference in June 1997 with a request for endorsement.

Listing proposals for CITES Appendices

Despite the important information-gathering efforts initiated since CoP 9, there have been very few new management initiatives for sharks. As a result of the growing concern over the unmanaged growth in shark fisheries and trade, government agencies in the US and UK have been asked to propose at CoP 10 certain species of elasmobranchs for listing on CITES Appendices. Additional proposals may be under consideration by other CITES authorities. These are only likely to be submitted to the CoP if national authorities decide, in consultation with other range states, that the proposals are well justified – decisions must be made by January 1997.

Species listed on Appendix I are considered to be endangered with extinction and therefore international trade in such species is only allowed under exceptional circumstances (domestic use is not affected). Trade in Appendix II species is subject to strict regulation and monitoring to ensure that it is not detrimental to the status of the listed species. This could be achieved by fisheries management programmes for all listed fish species which are landed for export.

The US Ocean Wildlife Campaign (a coalition of six conservation organisations) has proposed that spiny dogfish *Squalus acanthias* in the Northwest Atlantic be listed on Appendix II because growing international trade in meat and fins (mainly to Europe) has led to dramatic increases in landings, discards, and fishing mortality. This recently expanded but completely unregulated fishery is particularly problematic because it targets schools of mature females, threatening the reproductive potential of the population (see page 8). The OWC has also recommended that the dusky shark *Carcharhinus obscurus* in the Northwest Atlantic and Gulf of Mexico be listed on Appendix II because its abundance has declined by an estimated 80% since the mid-1970s. Fishing mortality still exceeds production, and fishing pressure on dusky and other large coastal sharks remains high as a result of strong demand for shark fins for overseas markets.

All sawfish species (family Pristidae) have been proposed to the US government for an Appendix I listing because of their severely reduced populations world-wide. As reported in previous issues of *Shark News*, while these species were historically relatively abundant in warm coastal waters and estuaries, they have disappeared completely from many parts of their former range, while elsewhere catches, even

of single individuals, are now unusual events. Sawfish fins enter international trade, as do their unique 'saws' which are valued as curios and reportedly used in traditional Chinese medicine (see page 10).

The UK has been asked by the Isle of Man government to propose, on its behalf, listing the basking shark *Cetorhinus maximus* on Appendix II. This species is listed as globally Vulnerable in the 1996 IUCN Red List, because fisheries records indicate that some local populations have declined by 50%–80% in a decade or less as a result of fisheries seeking liver oil, fins, and meat (see *Shark News* 6:4). The only remaining directed fishery for the species

in European waters is now driven primarily by the very high value of the huge fins in international trade. The species is protected within a 12 mile radius of the Isle of Man, but sightings are still in decline there, suggesting that the population is being affected by factors operating outside this small range of protection.

The Australian Marine Conservation Society and Humane Society International have asked the Australian government to put forward a proposal for listing the white shark *Carcharodon carcharias* (also listed as Vulnerable by IUCN) on Appendix I (see page 9).

Latin American Fisheries Development Organization (OLDEPESCA)

OLDEPESCA has requested information about shark fisheries in its region and is considering holding a workshop to discuss information needs and management strategies. Sharks were on the agenda at the XIIIth Conference of Fisheries Secretaries in November, which addressed the multilateral fishing problems of the Region. The main topic was Environment and Trade, with agenda items which included the Tuna/Dolphin controversy, the Inter American Convention for the Protection and Conservation of Sea Turtles, and shark fisheries, particularly in light of the recent proposal for the listing of certain species on CITES Appendices sent out to consultation by the US government.

International Commission for the Conservation of Atlantic Tunas (ICCAT)

ICCAT has responded to the CITES Shark Resolution by establishing a Shark Working Group as part of their Sub-Committee on Bycatch. A primary objective of the Working Group is to improve the identification of shark species caught as bycatch in fisheries targeting tunas and tuna-like species. ICCAT has produced and distributed a shark data collection form to all of its contracting parties, in order to improve data collection.

Possible outcomes?

Whether or not any of these proposals for listing species under CITES reach the full Conference of the Parties in June 1997, it is evident that sharks will figure prominently on the agenda. As such, the awareness of the conservation problems of sharks and rays will be increased among CITES delegates, government officials, fisheries managers and the public. It will also be apparent to all

those concerned with the CITES process that lack of significant progress with shark management following the 10th CoP will result in renewed pressure to include sharks on CITES Appendices at the 11th Conference.

So, while CITES is not itself a management treaty, discussions in this forum should help to stimulate domestic and regional fisheries regulation. Improved management before CoP 11, even in the absence of any successful listing proposals, could arise from the introduction of new management plans for elasmobranch fisheries, increased data collection efforts, the discouragement of wasteful fishing practices (e.g. finning and under-utilisation of sharks), and initiatives to reduce elasmobranch bycatch. In addition, the Parties could decide to establish a Marine Fish Working Group to address the special issues of CITES implementation for trade in commercially important fish species, such as sharks and sturgeons. Such a Working Group could make a valuable contribution to the debate, even if no fish listing proposals are agreed at CoP 10 next June, for this is an issue which will not go away.

Sarah Fowler, Editor.



Shark Specialist Group news

Meetings

1996 has been a very busy year for the Shark Specialist Group (SSG). Unusually, there have been two meetings of SSG members, one during the American Elasmobranch Society's meeting in New Orleans (June), and the other during the World Fisheries Congress in Brisbane, Australia, in August. The second was particularly well attended, thanks to the generosity of the United States National Marine Fisheries Service (NMFS), WWF's Endangered Seas Campaign, TRAFFIC International, UK Department of the Environment, National Audubon Society and other non-governmental organisations, as well as the employers of many members who allowed them to attend.

Species assessments and Action Plan

These meetings and a lengthy correspondence have helped the SSG to undertake a great deal of work. Priorities have included continued work on elasmobranch species assessments, both for the 1996 IUCN Red List (see report on page 4) and for the Shark Action Plan. The Action Plan has also progressed well, with circulation of two drafts, although some sections are still incomplete. Please note that continued prompt input from members will be essential if we are to complete the Action Plan on schedule within the next few months, for publication prior to the CITES Conference in June 1997.

CITES Animals Committee documents

All SSG members were consulted during the preparation and review of a discussion paper on the status of shark fisheries, compiled on behalf of the Animals Committee by the US NMFS.

The SSG also reported separately to the CITES Animals Committee on *The implications of biology for the conservation and management of sharks* (see page 1). Sarah Fowler and Merry Camhi attended the Animals Committee meeting with Alison Rosser of the IUCN Species Survival Commission in order to present this report. We are most grateful for the assistance and information provided at extremely short notice by many SSG members which helped to make the SSG document so useful. Our report will now be reviewed by contributors and made more widely available once this process has been completed (SSG members: please contact Merry Camhi if you would like to help with the review).

The SSG has also contributed to the work being carried out by TRAFFIC on reviewing the international trade in sharks (see page 6), with some members being commissioned to help carry out regional surveys for TRAFFIC or asked to review the draft report.

Shark News

This is the third issue of our newsletter, *Shark News*, distributed in 1996. We have not managed four issues a year, but the length has increased to 16 pages and the print run is now 1,300. This is purely thanks to the generous sponsorship we have received, acknowledged on the back cover of each publication. Donations also help towards newsletter expenses, but cover only a tiny fraction of the cost.

We do not yet have a sponsor for the next issue, so please send any offers or suggestions to the editors. We are also in need of ideas for future themes, copy for future issues and, particularly urgent, volunteer guest editors. Sourcing the material for three issues a year is very time-consuming for Sarah Fowler and Merry Camhi (particularly when we end up having to write a great deal of the text

ourselves) and it is difficult to do this as well as dealing with urgent Shark Group work.

Reappointment of SSG members

The end of 1996 also marks the end of the current IUCN Triennium and therefore of everyone's membership of the IUCN Species Survival Commission. SSG members must be invited to rejoin in 1997, once the IUCN has appointed the new co-chairs for the SSG (who will be Sarah Fowler and Jack Musick, with Merry Camhi continuing as a deputy chair). The present membership (about 130) includes many inactive members who will not be reappointed (but can continue to receive *Shark News*). Active members and new members who have important contributions to make (particularly from geographical regions where we have few contacts) will, in due course, be (re)appointed formally in writing by one of the co-chairs (see below). There are also some vacant regional vice-chair positions to be filled. Meanwhile, all active members are asked to consider their membership as continuing. We have too much urgent work underway to wait to be reconstituted!

New structure and terms of reference for SSG

As a result of the increasing significance of the input of the SSG to issues such as red listing elasmobranchs and preparation for the next CITES Conference, the IUCN Species Survival Commission has suggested that the Group draw up terms of reference (probably based on those developed for the African Elephant Specialist Group) and clear policies for inviting members to rejoin the Group in 1997. We will need to consider carefully the balance of membership expertise required to enable the Group to work most effectively, including representatives of governmental and non-governmental organisations, scientists, policy-makers, communicators, educators etc., and as balanced an input as possible from all geographical regions.

It has been suggested that a formal SSG Advisory Group should be set up to help direct the policy and priorities of the SSG and ensure that its output is authoritative and well-balanced. Such a Group would be comprised primarily of the Co-, Deputy and Regional Chairs, with additional input from appointed members whose area of expertise was not otherwise represented.

Members wishing to comment on these proposals should contact Sarah Fowler, Jack Musick or Merry Camhi.

Communicating with the Shark Specialist Group

Would all Shark Specialist Group members please send their email address to the editors and tell us whether you are a subscriber to Elasmo-L. This information will help us to improve our regular communication with you, reduce our high international postage costs, and let us know what proportion of members see our postings on Elasmo-L.

Thanks from the Acting Chair

I would like to thank everyone for their contributions to the work of the SSG over the past few years, and for your patience with my frequently slow response to your communications. Most members will already be aware that all Shark Specialist Group posts are voluntary, and carried out without clerical help. It is therefore sometimes impossible to keep to deadlines or find the time to respond to mail which is not of the highest urgency when full-time work (or family duties) intervene. Please, therefore, accept my apologies if one of your letters is in the large backlog of unanswered mail on my desk.

Finally, I would like to express my particular thanks to the two organisations which have provided the Shark Group with a great deal of support, and without which we would not have been able to achieve the work described above: the National Audubon Society for supporting Merry Camhi's work, and the Nature Conservation Bureau for supporting mine and the production of this Newsletter.

Sarah Fowler, Acting Chair



Red List assessments for sharks and rays

The 1996 IUCN Red List of Threatened Animals has now been published by IUCN. This Red List is the first to apply the new quantitative IUCN criteria for assessing and classifying the degree of threat to species from biological and environmental factors which can cause extinction. It has no specific legal force, but is used by governments and other organisations as a guide to setting priorities for conservation. It lists 5,205 threatened species (118 of which are marine fish) and includes 14 elasmobranchs. The 1990 and 1994 Lists included just three sharks, the whale shark (category of threat: Indeterminate), white shark and basking shark (Insufficiently Known). These assessments reflected the lack of data available for the species and the difficulty of applying the old Red List criteria.

New Red List criteria

The new criteria, published in 1994, are applied to two main aspects of extinction risk: small population and declining population. Most focus in the past in relation to extinction has been on the first category. However the new IUCN criteria also provide for the listing of declining populations, regardless of their population size. This is based on the conviction that rapid declines of large populations are at least as 'risky' as minuscule declines in tiny populations.

The key statistic for population decline is related to a period of time appropriate to the biology of the species in question – the three generation period. Such a decline may have taken place during the preceding three generations, or be projected into the future (for example where such a decline is likely to take place if current fisheries practices are not altered). Since it is obviously impossible to quantify precisely the size of elasmobranch populations, changes in indexes of abundance (such as catch per unit effort) may be used to infer changes in population size. The criteria also require the precautionary principle to be used. Thus, where a population decline is known to have taken place (e.g. as a result of fisheries), but no management has been applied to change the pressures on the population, the decline is assumed to be likely to continue in the future. If fisheries are known to be under way, but no information is available on changes in CPUE, data from similar fisheries elsewhere may be used by informed specialists to suggest likely population trends. Additionally, where no life history data are available, the known age at maturity of a very closely related species may be used to estimate age at maturity.

Testing the criteria

The revision of elasmobranchs in the Red List using the new criteria (initially presented in *Species* 19:16–22 – the Newsletter of the Species Survival Commission, December 1992) was first discussed at a Shark Specialist Group meeting in Bangkok, December 1993. Some members of the Shark Specialist Group (SSG) subsequently began, with advice from IUCN, to test the new criteria on a few species of elasmobranchs. This work gathered pace with the award of a grant from WWF's Endangered Seas Campaign to the SSG for carrying out Red List assessments on additional species in 1995. In November 1995 all SSG members were asked to become involved in this Red Listing work, so that a wider range of species could be assessed for the IUCN Red List and the SSG's Action Plan. A summary of draft Red List assessments for eight elasmobranchs, including examples of freshwater, deep sea, and coastal species, was circulated,

together with a detailed worked example demonstrating how the assessment for the basking shark had been reached. SSG members were asked either to take the lead on undertaking assessments for individual species or groups of species, and/or to review those assessments already been made. As a result, a few additional draft assessments were produced.

Marine fish workshop, London

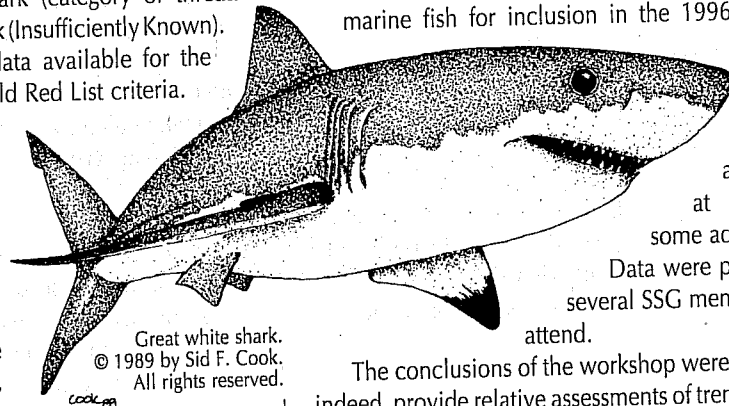
A Marine Fish Red Listing Workshop was held in April 1996 at the Institute of Zoology, London, in collaboration with IUCN and WWF (see last issue of *Shark News*). Thirty-one participants from nine countries attended. The main aims were to evaluate the applicability of the new criteria to marine fish species, and to evaluate candidate marine fish for inclusion in the 1996 Red List. Draft species assessments produced earlier by members of the SSG were discussed and amended where necessary at the workshop, and some additional species assessed. Data were provided for discussion by several SSG members who were unable to attend.

The conclusions of the workshop were that the new criteria may, indeed, provide relative assessments of trends in the population status of species across many life forms. However, participants stressed that these criteria do not always lead to equally robust assessments of extinction risk, which depend partly upon the life history of the species. For example, using the 'A' criterion, a decline of over 50% or over 80% in the population of a species with high growth rate, high reproductive potential and early maturity does not necessarily mean that the species is Endangered or Critically Endangered with extinction. It may be a significant overestimate of the actual extinction risk. Indeed, a managed fishery for a teleost fish may aim for a 50% depletion of the unfished stock level in order to maximise yield. Nevertheless, it was recognised that when such fisheries result in a managed reduction in a species population to a new stable level, then the threatened status of the species will be removed from the Red List once the population has been maintained at its new level for the three generation period. This strategy will also ensure that a species is listed until the management has been demonstrated to be successful (history has repeatedly shown, both in terrestrial and marine environments, that management schemes are, in practice, rarely followed).

Caveats

While the reproductive capacity of elasmobranchs and their ability to recover from depletion is much lower than teleosts, some of the same considerations still apply, particularly for very wide-ranging species. However, it was agreed that the marine fish assessments produced at the workshop could be published in the 1996 Red List, provided that the preliminary nature of the marine fish assessments in general was highlighted and the need for further investigation of the issue recognised. The following caveat therefore appears in the introduction to the Red List:

"The criteria (A–D) provide relative assessments of trends in the population status of species across many life forms. However, it is recognized that these criteria do not always lead to equally robust assessments of extinction risk, which depend upon the life history of the species. The quantitative criterion (A1a, b, d) for the threatened categories may not be appropriate for some species, particularly those with high reproductive potential, fast growth and broad geographic ranges. Many of these species have high potential for



Great white shark.
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Elasmobranchs assessed for the IUCN Red List of Threatened Animals

Species	IUCN Red List categories and criteria	
	Published Red List	July 1996 revision (Brisbane)
<i>Hexanchus griseus</i> Bluntnose sixgill shark	VU A1d+2d	LR (nt)
<i>Dalatias licha</i> Kitefin shark	VU A1d+2d	LR (nt)
<i>Rhincodon typus</i> Whale shark	Data Deficient	No change
<i>Carcharias taurus</i> Sand tiger, gray nurse shark	EN A1ab+2d	VU A1ab+2d EN A1ab+2d, SW Atlantic & E Australia
<i>Cetorhinus maximus</i> Basking shark	VU A1ad+2d	No change
<i>Carcharodon carcharias</i> Great white shark	VU A1bcd+2cd	No change
<i>Lamna nasus</i> Porbeagle shark	VU A1bd+2d	LR (nt) LR (cd) in NW Atlantic, VU A1bd+2d in NE Atlantic
<i>Carcharhinus limbatus</i> Blacktip shark	VU A1bd+2d	LR (nt)
<i>Carcharhinus obscurus</i> Dusky shark	EN A1d+2d	LR (nt) VU A1bd+2d in US Atlantic
<i>Carcharhinus plumbeus</i> Sandbar shark	VU A1bd+2d	LR (nt) VU A1bd+2d in US Atlantic
<i>Glyphis gangeticus</i> Ganges shark	CR A1bcde+2cde, C2b	CR A1cde+2cde, C2b
<i>Pristis microdon</i> Greattooth/freshwater sawfish	EN A1bcd+2cd	No change CR A1abc+2cd in SE Asia
<i>Pristis pectinata</i> Smalltooth or wide sawfish	EN A1bcd+2cd	No change CR A1abc+2cd in NE & SW Atlantic
<i>Pristis perotteti</i> Largetooth sawfish	EN A1bcd+2cd	CR A1abc+2cd
<i>Pristis pristis</i> Common sawfish	EN A1bcd+2cd	No change
<i>Bathyraja abyssicola</i> Deepsea skate	Data Deficient	No change
<i>Himantura chaophraya</i> Giant freshwater stingray	EN A1bcde+2cde	VU A1bcde+2ce CR A1bcde+2ce in Thailand
VU: Vulnerable EN: Endangered CR: Critically Endangered LR: Lower Risk nt: near threatened cd: conservation dependent lc: least concern.		

Despite the caveats already agreed at the London workshop, many SSG members at these meetings continued to express their concern about the way in which the population decline criterion (A) appeared to seriously over-estimate extinction risk, even though the criterion could readily be applied to a range of population data derived from catch rates and fisheries independent field research. Indeed, many members queried whether the Red List criteria were applicable to sharks, because they did not consider elasmobranchs (particularly wide-ranging species) could really be at global risk of biological extinction. It was also considered that species with geographically distinct populations should be assessed on a population basis, not globally, particularly since data for many populations are lacking.

As a result of these discussions, the precautionary approach was generally disregarded and the extinction risk for many of the more common and wide-ranging elasmobranchs listed at the London workshop slightly downgraded where there was any doubt whether the estimated population decline was actually operating at a global level. Conversely, the threatened status of some of the more seriously threatened and rarer species or populations was actually increased.

These revisions were all immediately submitted to IUCN on the understanding that there was still just enough time to incorporate these amendments into the published Red List. Unfortunately, we later heard that preparation of the copy was too far advanced for changes to be made, although they were added to the Red List Web site. The published Red List therefore lists the assessments produced in London; these and the updated assessments from the Brisbane meeting are shown in the Table.

This list will continue to be updated and extended by the SSG as more information becomes available; comments and new data should be sent to Sarah Fowler for forwarding to the experts who provided the assessments. The next major revision of the elasmobranch Red List assessments (incorporating many additional species) will be published in the Shark Specialist Group's forthcoming Action Plan. Additionally, the most recent version of the list is always available for consultation on the World Wide Web: (http://www.wcmc.org.uk/data/database/rl_anml_combo.html).

Sarah Fowler, Acting Chair, Shark Specialist Group

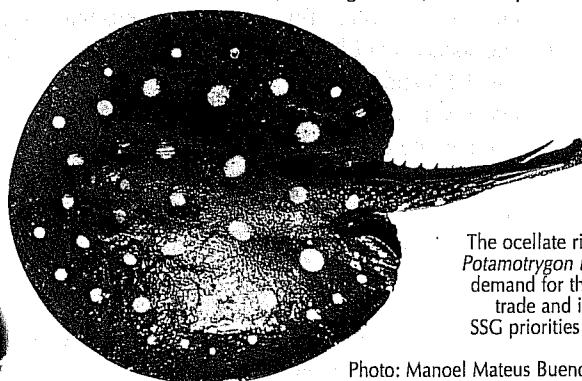
population maintenance under high levels of mortality, and such species might form the basis for fisheries."

Another note in the marine fish listings section states: "The marine fish listings below represent the first attempt to interpret the conservation status of marine fishes according to the new IUCN Red List criteria. These criteria require further evaluation in order to assess how well they reflect extinction risk in marine fishes."

Members of the SSG will be helping with this evaluation and assessment of the 1994 categories and criteria. These will be revised once the majority of the problems of this sort have been identified and addressed. Indeed, at the World Conservation Congress in Montreal, the Species Survival Commission was committed to a review of the criteria, with special reference to marine species. This review will take place soon. Please send comments/contributions to Sarah Fowler.

SSG Red List revisions

The Red List assessments produced at the London workshop were circulated to SSG members and comments invited on these and any other species (from a priority shortlist of about 100 proposed for future attention). Some of the assessments were discussed in detail by SSG members and non-members through the American Elasmobranch Society's (AES) Elasm-L discussion forum, and at an SSG meeting in New Orleans, June 1996. SSG members (and interested non-members) attending the World Fisheries Congress, Brisbane, Australia were also invited to attend a afternoon meeting on 31 July, when another full discussion of the Red List assessment categories and criteria took place. On this occasion additional population data were discussed, and all the species listed in London were reassessed on the basis of a general consensus or majority vote.



The ocellate river stingray *Potamotrygon motoro* is in demand for the aquarium trade and is one of the SSG priorities for Red List assessment.

Photo: Manoel Mateus Bueno Gonzalez.

New study calls for improved shark fisheries management and monitoring

Bobbie Jo Kelso, TRAFFIC International

The trade in sharks and shark products is vast and increasing, with at least 125 countries becoming involved and new markets emerging in recent years, according to the findings released in early December of an intensive global study by the TRAFFIC Network.

TRAFFIC, the wildlife trade monitoring programme of IUCN – The World Conservation Union and World Wide Fund for Nature (WWF), found that in some regions the increased trade in shark products such as fins, cartilage and liver oil have undoubtedly played a role in increased shark harvests. At the same time, however, most fisheries for sharks and related species remain largely unregulated or unmonitored, and catch and landings are much more extensive than official statistics indicate.

Pivotal to the findings, published in the new TRAFFIC report *An Overview of World Trade in Sharks and other Cartilaginous Fishes* by Debra A. Rose, is that the information available on the volume of catch, landings and trade is significantly incomplete and, in some cases, can even be misleading. In addition, the species involved are rarely specified.

Regional TRAFFIC studies found that sharks, skates and rays have gained an increasing share of domestic and international meat markets in recent years. In South America and the USA, for example, fresh shark steaks and fillets are commonly offered in supermarkets. Shark meat, often sold under market names such as Rock Salmon and *saumonette*, also features prominently in the diets of Europeans. New shark meat products are also appearing in markets. One recently established processing plant in Port Adelaide, Australia, produces shark jerky from tiger sharks *Galeocerdo cuvier*, mako sharks *Isurus* spp., sawfishes (Pristidae) and blue sharks *Prionace glauca* for export to North and South Korea.

Shark fins are also a highly sought after commodity, particularly for the Chinese delicacy shark fin soup. Hong Kong sits at the centre of a global trade. In addition to Hong Kong, China and Singapore appear to be the world's biggest shark fin traders. Shark fins are now among the world's most expensive fisheries products. In Hong Kong, retail prices generally range from US\$40 per kilo to US\$564 per kilo, while a bowl of shark fin soup can sell for up to US\$90.

While the trade in shark fins has undoubtedly increased, one key finding is that a significant proportion of reported world trade in shark fins may in fact be repeat counting of the same fins. According to Hong Kong Customs data, for example, total reported imports of shark fin to Hong Kong rose from 2.7 million kilos in 1980 to 6.1 million in 1995. However, much of the increase appears to be attributed to fins counted at least twice in trade when exported from Hong Kong to China for processing and then re-exported back to Hong Kong for domestic consumption or export. This repeat counting may also appear in the trade statistics of China, Singapore and regional trade centres, such as the USA and Yemen.

In recent years, a variety of new developments have taken place in the shark fin trade. In the USA, for example, fin dealers report the entry of numerous new entrepreneurs into the trade, increased market development and communications and thus more competition. A resulting rise in fin prices greatly stimulated a directed shark fishery in the south-eastern part of the country. Increased trade networks and fin prices have also led to new markets for shark fins in Africa and increased fishing effort, with Chinese fin traders from Hong Kong supplying gear to local fishermen in West Africa in return for any



Dried shark fins on sale in Hong Kong. Photo: Rob Parry-jones, TRAFFIC.

shark fins harvested. In Tanzania, the number of fin traders has rapidly increased, resulting in fin prices rising by some 70 per cent.

The liver and body oils of sharks, such as the piked or spiny dog *Squalus acanthias*, are used in the USA and Europe in the tanning and curing of leather. Shark liver oil is also used in Japan in sanitary wipes for cleaning toilets, in a French perfumery, and is sometimes used as an ingredient in an over-the-counter haemorrhoid ointment. Shark liver oil is also manufactured in the USA and distributed internationally. In Africa, shark liver oil is used or traded domestically within Eritrea, Somalia, Kenya, Tanzania and Madagascar for use in maintenance of traditional fishing vessels.

Shark liver oil also yields squalene, an acyclic hydrocarbon used in the manufacture of lubricants, bactericides, pharmaceuticals and cosmetic products such as skin creams. Japan has historically been one of the most important squalene producers. While export data is not available for Japan after 1980, South Korea reported importing an average of 52 tonnes annually from Japan during 1987 to 1994. South Korea itself appears to be the world's largest consumer.

One production trend suggested by TRAFFIC's regional market studies is a decline of shark liver and liver oil processing and marketing by many former suppliers, in part because of the difficulty of collecting the livers and the strong odour of the products. As a result, much of the current production has shifted to developing countries. While these products were found in many countries during the study, the prevalence of products found in European countries and the development of new fisheries for liver oil in Spain indicate that European markets for shark liver oil or squalene products appear to be growing.

Shark cartilage is a relatively new product on the market and is used to produce several medicinal and food products. Neither national fisheries agencies nor Customs agencies report production or import volumes. TRAFFIC research indicates that major producing nations include Australia, Japan and the USA. Shark cartilage is also supplied by and/or manufactured in a number of other countries, such as Argentina, Mexico, New Zealand and possibly Kenya. In the USA alone, pre-packaged cartilage products are marketed and exported under dozens of brand names to about 35 countries. Retail prices can reach up to US\$100 for a single bottle of capsules.

Improved trade monitoring is clearly needed to assess the species composition of products in trade and to detect regional and worldwide trends in demand and supply. Even more pressing, however, are improvements in basic fisheries management, research and collection.

Reference

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Activities undertaken by FAO towards the implementation of CITES Resolution Conf. 9.17 on Sharks

Dr David Ardill,
FIDI, Food and Agriculture Organization of the United Nations

The Ninth Conference of CITES Contracting Parties requested the collation of species-specific catch and trade data on sharks. In response to this request, FAO agreed to collate data supplied by national reporting offices and by regional fishery commissions. Funding for this activity has been secured through one of the elements of a Trust Fund established by the Government of Japan.

The FAO studies have been broadened to cover all elasmobranchs and it is proposed to:

- undertake a consultancy on the biological and trade data available on sharks;
- produce an FAO Global Species Catalogue for batoid fishes (skates and rays) and revise the Shark World Species Catalogue produced in the early 1980s; and
- update the *Shark Utilization and Marketing Monograph* issued in 1978.

The first activity should be completed by the second or third quarter of 1997. The batoid species catalogue and shark utilisation monograph are unlikely to be completed before the end of 1997.

The data currently available to FAO are highly variable in quality and cover only a proportion of catches and trade. In particular, catch data which have been submitted by national statistical reporting offices are rarely available at the species level and generally only concern landed catch, as discards are not currently reported.

The catch data held by FAO have not been collated with the intention of stock assessment or management. As a consequence, the level of aggregation is by country, year, species and FAO statistical area. For management, data should be by species, fishing gear, month and in finer spatial strata.

While data collected by regional fishery organisations may eventually be forthcoming at the required level of detail, they will primarily concern the oceanic species of sharks, rather than the coastal species of elasmobranchs, which may be most at risk.

Few national statistical systems are designed to handle more than a handful of species. FAO has designed 'generic' software for statistical recording that removes limitations on the number of species which can be recorded. However, collecting statistics on elasmobranchs would require enumerators to be trained in species identification. This may be extremely difficult, particularly when dressed carcasses or fins are the only portions landed. Also, few elasmobranchs are caught in directly targeted fisheries. Accurate statistics of discards might only be achieved through observer programmes which are costly and difficult to run.

Trade data are largely compiled by customs authorities and species identification problems are compounded by the fact that much of the elasmobranchs traded are in a highly processed form such as dried, salted, cartilage and oils. Far from being reported at the species level, many elasmobranch products are classified simply as 'fish'. Trade patterns may be complex involving multiple imports and exports of products such as fins into the same country at different levels of processing which could lead to double counting. Long storage can also blur the origin of products.

It is unlikely that national fisheries statistical systems will be able, in the near future, to provide the level of detail needed for management. In tuna fisheries, this has been recognised and has

led to the creation of treaty-based management bodies. Such a solution might be more difficult to achieve for sharks in view of the generally marginal economic interest of sharks.

A more focused approach is therefore needed, based on the known biological characteristics of the species affecting their susceptibility to overfishing, combined with recent catch trends for the area or country involved.

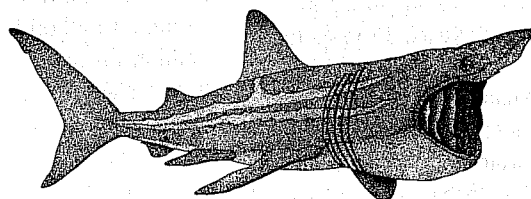
The FAO consultancy on biological and trade data on sharks started in July and the consultant – Dr Jose Castro from the US NMFS Southeast Center – has been to FAO to examine available data. Bibliographic research and the examination of available data sets is under way. Scientists in countries with shark fisheries for which data are available and, if possible, where management has been applied, will be requested under authors' contracts to write detailed descriptions of the fisheries, data collection and management experience, using a framework for comparability.

A data form was mailed to all the statistical reporting offices supplying data to FAO. While this may duplicate work undertaken by CITES, different information sources are being targeted. As detailed data become available, a database will be set up in FAO. The design and implementation, as well as the modalities of access or data diffusion, still need to be elaborated.

FAO will also undertake genetic studies to determine the factors permitting the identification of elasmobranch species. This should provide a valuable tool where body parts are not sufficiently large to permit identification. It is extremely unlikely, however, that this type of tool will be usable in the foreseeable future for statistical purposes. The cost and complexity will limit the application to small samples for research or forensic purposes.

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Basking shark
Cetorhinus maximus.
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Elasmobranchs listed under Barcelona Convention Protocol

The Barcelona Convention for the Protection of the Mediterranean Sea (1976) Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean was signed in Barcelona on 10 June 1995. There are three Annexes to the Protocol. Annex I: Common Criteria for Choice of Protected Marine and Coastal Areas, Annex II: Endangered or Threatened Species; and Annex III: Species whose Exploitation is Regulated. Annex II lists three elasmobranchs: the white shark *Carcharodon carcharias*, basking shark *Cetorhinus maximus* and giant devil ray *Mobula mobular*. *Mobula* was originally included in Annex III, but was transferred because of its endemism, limited range, rarity, low reproductive rate, and vulnerability in fishing gear. Annex III lists shortfin mako *Isurus oxyrinchus*, porbeagle *Lamna nasus*, blue shark *Prionace glauca*, white skate *Raja alba*, and angelshark *Squatina squatina*. Malta filed a reservation on most of the Annex III species (including *Mobula* prior to its transfer to Annex II), pending a re-evaluation of the implications for Maltese fishermen.

The Mediterranean was formerly part of the range of two, possibly three, species of sawfish (family Pristidae). The omission of these globally threatened species from the Protocol suggests that they may now have been extirpated from the region.



Spiny dogs – is history repeating itself?

Mistaken identity: in confusing a shark for a fish, fishermen and managers in the NW Atlantic have squandered a once-abundant resource

Michael Rivlin

Perhaps it's their name – dogFISH – that's led to the confusion on the part of fishermen and managers. Or perhaps it's their modest size. Whatever the explanation, US NW Atlantic fishermen have been allowed to fish spiny dogfish *Squalus acanthias* as though they were teleosts, without paying heed to the axiom that a sustainable, directed shark fishery is an oxymoron ... especially one that proceeds in the absence of management.

As a result, although a directed US domestic fishery in the NW Atlantic for the sharks began only in the late 1980s, there is overwhelming evidence that the seemingly inexhaustible stock of dogfish – once regarded as nuisance 'trash' fish, and then as the 'underutilised' last refuge of beleaguered fishermen – are either near collapse or veering in that direction. At the very least, they have been impacted to a point at which it will take them years to recover.

Swollen fleet

Dogfish life history – long life, late maturation, and low fecundity comparable to other sharks – makes them especially susceptible to fishing pressure. Females spawn at age 10 to 20 years, and give birth to an average of 6 to 10 pups after a gestation period of 16 to 22 months – a maturation period rivalling that of the Indian elephant. The maximum reported age for females is 40 years, 35 years for males.

In the NW Atlantic, the sharks follow a seasonal north-south migration route. Dogfish head to waters off North Carolina in the fall and return to the Mid-Atlantic in the spring, eventually concentrating in waters between Cape Cod and Nova Scotia. An ever-expanding US fleet of small gillnetters and hook-and-liners now fish for dogfish during the summer. The fleet of somewhat larger boats that follows the dogfish south to Maryland in the winter has grown just as rapidly.

Two factors account for the fishery's rapid rise. Steadily increasing prices paid by Europeans, who buy virtually the entire catch of dogfish, have in recent years made the sharks a lucrative catch. This was combined with the New England groundfish collapse that left fishermen scrambling for fish to put in their hold. With mature females moving inshore to bays and estuaries during the summer, dogfish were one of the few as-yet-unregulated species accessible to smaller boats shut out of most other fisheries.

In 1990 annual dogfish landings, which had been averaging about 4,500 mt, climbed sharply to 14,900 mt, and by 1993 had shot up to 20,400 mt – a level of fishing mortality five times that of the late 1960s. Landings for 1994 and 1995 have remained steady.

In addition, discard rates – imprecisely monitored as are many aspects of this unregulated fishery – are nonetheless estimated to be very high. A 1993 study showed discard mortality to be 2/3 or

more of reported landings, and other estimates say the rate may equal or exceed actual landings.

The impact of this high fishing mortality is reflected in changes in stock size, composition, and catch per unit effort (CPUE). According to a National Marine Fisheries Service (NMFS) 1994 stock assessment, although stock biomass was about 4–5 times that of the late 1960s, the spawning portion of the biomass had not increased since the late 1980s.

In addition, scientists and fishermen estimate that between 1980 and the present CPUE has decreased by 30% to 50%. A NMFS study of catch effort by Gulf of Maine gillnetters confirms this almost 50% decrease. Gillnetters who could once fill their boats before noon now use two to three times more net, with mesh two inches smaller than that employed previously, and still can't achieve catches they once had.

Females targeted

Compounding the problems associated with fishing on a long lived, late maturing species with low fecundity, dogfish swim in schools segregated by size and, for the larger individuals, by sex. This behavior has made them especially vulnerable to a fishing fleet that, until recently, pursued only the largest fish – mostly mature females preferred by the European market that buys about 95% of the catch.

Swept area estimates of fishable biomass – fish greater than 80 cm and virtually all females – which had increased threefold from 1960

1988, have declined more than 10% since then. And there is significant evidence that the structure of the population has shifted towards smaller, immature females and males. The average size of dogfish in commercial landings and in the NE trawl survey has declined by about 5 cm since 1982. As a result, according to Michael Hopper, a veteran dogfish buyer formerly with Worldwide Seafoods, larger European processors have been forced to accept smaller fish than they would have years ago. The minimum weight of sea pounds once demanded by buyers has dropped down to four pounds, and the average size of the sharks landed has continued to decrease from eight to six pounds.

Experts had predicted that strict groundfish regulations would drive hundreds of otter trawlers in search of new fish stocks into the dogfish fishery. However, according to Hopper, landings may have peaked in 1995, and he predicted that by 1997 they would begin to fall. In addition, the buyer thinks that the fishermen's realization that dogfish stocks

Pacific Coast Catastrophe Brewing

With a fleet of Pacific Northwest fishermen searching for a substitute species after the late 1980's salmon collapse, fisheries managers seem oblivious to unregulated, directed dogfish fisheries that have begun developing along the Washington, Oregon and California coasts and in Puget Sound.

Washington landings have crept up steadily, from around 3 million lbs in 1990 to around 6.8 million lbs in 1995. Oregon and California fisheries are in incipient stages, but growing rapidly. However, at present there is no talk of instituting a management plan and no stock assessment data being gathered which would aid in developing such a plan.

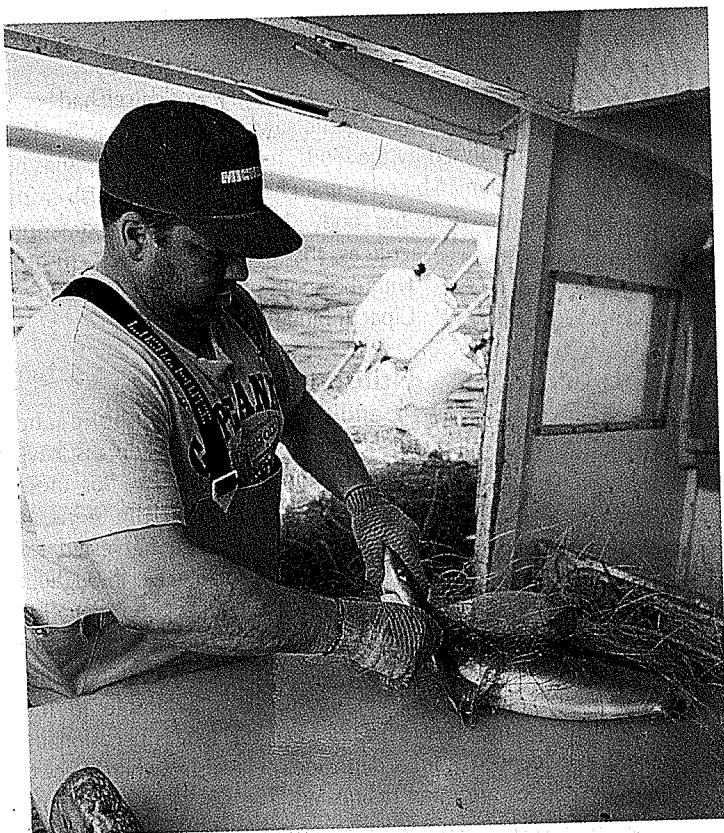
For a recent lesson in what intensive fishing can do, Pacific Northwest residents can look up the coast to British Columbia, where dogfish landings have fallen from an average of 9 million lbs in 1985-1989 to an average of 4 million pounds in 1990-1995. A similar boom-and-bust pattern was seen in British Columbia during a fishery for

diminishing accounts for the fleet size peaking and stabilising at low levels. "This is not a growth segment of fishing industry anymore," observes Hopper.

Despite these question marks over the fishery's future, some regional fishery council members and fisheries managers persist in portraying the fishery as it once was – rolling out welcome mats instead of posting warning signs.

For example, a Massachusetts Governor's Seafood Task Force program to stimulate interest in alternate species includes dogfish on its list of 'underutilised' species. And while the focus of the campaign is on developing a market for small, currently discarded material, probably in value-added products that will minimize the public's overwhelming rejection of 'cape shark' – stimulating participation is the last thing this fishery needs.





Spiny dogfish being removed from gillnet, New Bedford, MA. Photo: Michael Rivlin.

Scientists ignored

Some NMFS scientists and management council staffers have been saying for the last couple of years that if there is any chance of saving the NW Atlantic stock and establishing a sustainable fishery, a fishery management plan (FMP) must be implemented as soon as possible. The 1994 "Report on the 18th Northeast Regional Stock Assessment Workshop" issued by NMFS' Northeast Fisheries Science Center in Woods Hole concluded that if the fishery was allowed to continue without control, "the stock will eventually decline." And in 1995, NMFS termed the stock "fully utilised."

But as recently as early 1996, the Mid-Atlantic and New England Fishery Management Councils recommended postponing development of such a plan – in part because important scientific findings were not available to policy makers.

Opponents to a management regime argued that dogfish were a detriment to groundfish recovery, and that if anything they should be fished down rather than built up. Dogfish, they said, were at fault for the groundfish crisis. And if not exactly to blame, then their very presence made groundfish recovery impossible. One of the few scientific facts every New England fisherman and manager has learned is that the ratio of dogfish and skates to groundfish on Georges Bank is now 75% to 25% – exactly the inverse of what it was in past years.

Dogfish are opportunistic feeders, and their diet does include a variety of commercially valuable species. However, according to Dr Mike Fogarty, chief of the food chain dynamics investigation at the Northeast Fishery Science Center, his soon-to-be-released, multi-year study indicates that attempts to thin dogfish populations

are based on faulty assumptions. Fogarty says that, when compared with other species, dogfish are relatively unimportant predators on cod and haddock. "If you removed all the dogfish from the system," states the ecologist, "I wouldn't expect that it would have a big impact on groundfish."

Fogarty's studies have revealed that dogfish do prey heavily on herring and mackerel. However, he points out that many other predators, including cod and hake, feed on the same prey. In addition, Fogarty notes that "because dogfish are so highly migratory, the effects on any part of the coastline are transient and temporal." Removing dogfish, concludes the scientist, probably would not have an impact on herring and mackerel either.

Fogarty acknowledges that dogfish do compete with groundfish for food, and that more locally abundant food supplies could conceivably increase the recovery rate for cod and haddock. But he observes that stocks of herring and mackerel are so plentiful that availability of prey isn't a limiting factor and so concludes that groundfish populations are likely unaffected by the large concentrations of dogfish.

Fogarty has been presenting his findings to fishery council members, and has apparently made an impression on some individuals. In November 1996, the Mid-Atlantic Fisheries Management Council restarted the delayed dogfish management process.

Michael Rivlin,

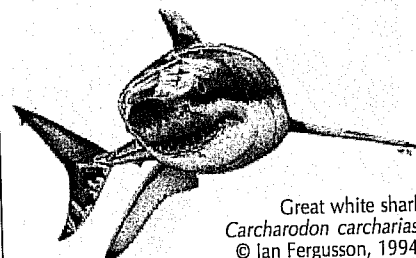
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In November 1996, the Mid-Atlantic Fisheries Management Council restarted the delayed dogfish management process. The Council should be adopting an information document in December that will solicit public comments early in the new year. This is the first step in the long and difficult process toward the drafting and implementation of a Fishery Management Plan for spiny dogfish, which can be accelerated by input from the scientific and conservation communities.

Comments should be submitted to:
David Keifer, Executive Director
Mid-Atlantic Fisheries Management Council
Federal Building, 300 South New Street
Dover, DE 19901, USA



Great white shark
Carcharodon carcharias.
© Ian Fergusson, 1994.

News from Australia

As *Shark News* goes to press, the Australian Marine Conservation Society (AMCS) and Humane Society International (HSI) are lobbying their Federal Environment Minister and the Australian National Conservation Agency to nominate the great white shark for a CITES appendix listing. AMCS and HSI have employed a consultant to prepare the nomination to

speed up the process. The Minister has indicated his willingness to submit the nomination in time for the January 1997 deadline, as long as he has support from other range state governments. This is urgent! being sought.

While a decision is still awaited regarding the nomination of the great white shark under the Commonwealth Endangered Species Protection Act, directed fishing for this species has just been banned in New South Wales waters. Indications are also promising with another of the state nominations. An application by HSI to seek protection of the great white shark in Victorian State waters under the Flora and Fauna Guarantee Act 1988 has been supported by the State's Scientific Advisory Committee. A decision should have been reached by the time of the next issue of *Shark News*.

Bill Foster, Australian Marine Conservation Society



The cultural and economic importance of sawfishes (family Pristidae)

Matthew McDavitt

Throughout their range, sawfishes have been important to mankind both as potent symbols and valued commercial resources. These unique elasmobranchs have attracted significant attention due primarily to their large size (up to 7 meters in length), distinctive appearance, and their exceedingly shallow marine and freshwater habitats, placing them in close proximity to human settlements.

Cultural history

The imposing sawfishes have inspired an extensive mythology among tribal societies, particularly in Central America, West Africa, Papua New Guinea, and Australia. Many of the sawfishes depicted by native cultures represent sacred totemic ancestors, the supernatural beings credited with shaping the landscape and establishing social order. By re-enacting the primal creative acts of these sawfish progenitors, societies draw upon their omnipresent energy to bring renewal and prosperity to their community.

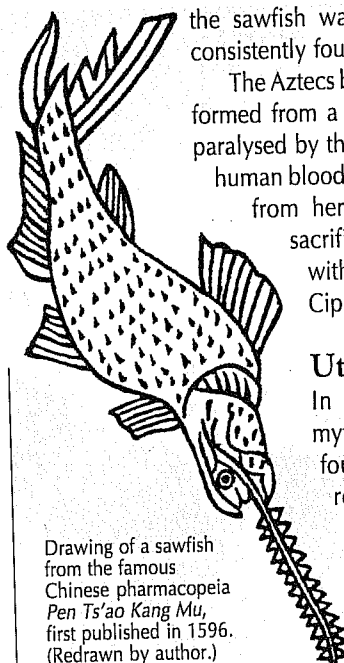
Admired for their predatory prowess, sawfishes are considered by some tribes to be sentient spirits who control fish fecundity. Sawfish spirits of the Sepik river in Papua New Guinea, for instance, punish those who break fishing taboos by unleashing destructive rain storms.



Saw of a small *Pristis microdon* from the Kinabatangan River, Sabah. These were traditionally nailed over doors to keep ghosts out of houses, or wrapped in cloth and hung over cradles to stop babies crying. Photo: Sarah Fowler.

Perceived as 'sharks with swords', sawfishes are often associated with warfare. The rostra of these animals have been fashioned into weapons in the Philippines, Papua New Guinea, and even New Zealand, where interestingly, sawfishes are not found. To the Akan people of West Africa, the sawfish symbolised the indisputable authority of the king and the prosperity of the kingdom. Today, this ancient symbol appears on the common currency of the seven West African Monetary Union nations. The sawfish has also been an emblem of Western warfare. During WWII, 26 German U-boats, one American submarine, and Germany's naval commandos were all adorned with sawfish insignia.

Sawfishes have appeared prominently in the iconography of several major world religions. In Thai Buddhist temples, sawfishes adorn cosmological and narrative paintings. Similarly, sawfishes appear in figurative Islamic art from Indonesia. In Medieval Europe,



Drawing of a sawfish from the famous Chinese pharmacopeia *Pen Ts'ao Kang Mu*, first published in 1596. (Redrawn by author.)

the sawfish was one of the few marine animals consistently found in the Christian Bestiary.

The Aztecs believed that the world itself had been formed from a titanic sawfish called Cipactli who, paralysed by the Gods, required regular feedings of human blood to grant her strength to nourish crops from her body. In certain heart extraction sacrifices, the victim's neck was crushed with the snout of a sawfish, symbolic of Cipactli biting into her food.

Utilisation and trade

In addition to their symbolic and mythological inspiration, humans have found many practical uses for these remarkable creatures. The skins of sawfishes have been harvested for leather on a small scale throughout their range. A recent book detailing the American cowboy boot industry lists sawfish leather as one of the exotic skins available to the

adventurous consumer (Beard 1992). Liver oil, too, is occasionally exploited, as evidenced by tribal depictions of sawfishes where the two primary liver lobes are often delineated. The sawfishes' individual rostral teeth, pulled from the saw, have been fashioned into woodworking tools in prehistoric Florida and carved into clothing pins in India. Significant harvest of sawfishes for meat has occurred in Lake Nicaragua where unregulated exploitation virtually eliminated sawfishes from the region (Thorson 1982), and Asia, where sawfishes are still consumed.

World-wide, the sawfishes' tooth-studded saw is valued as a trophy or curio. Until recently, imported rostra of the Indo-Pacific sawfish *Anoxypristis cuspidata* were readily available in America from biological supply companies and sea-shell shops. The steady disappearance of these rostra from American markets may reflect the world-wide decline in sawfish populations due to over-exploitation and habitat destruction.

A significant threat to sawfish populations appears to be the Asian market for sawfish parts as healing foods and medicines. In the 400-year old *Pen Ts'ao Kang Mu*, the celebrated encyclopaedia of Chinese herbal medicine still referenced today, sawfish skin and meat are extolled to cure heart problems, infections, internal parasitic infestation, weakness, and thin blood (Li Shih-ch'en 1596, Read 1939). Dried fins prepared into a soup admired for its strengthening properties, are readily collected for the lucrative Chinese shark fin market. The presence of sawfish rostra in modern Chinese apothecary shops indicates medicinal use as well.

Living sawfishes also have commercial value. At least five major travel guides on Australia describe the 'exotic' freshwater sawfishes of the Fitzroy river to entice tourists to visit Geikie Gorge National Park. As exhibits, live sawfishes are highly prized by large public aquariums world-wide due to their impressive size, extraordinary appearance, and general hardiness in captivity.

In the past several decades, marked declines in sawfish populations have been noted world-wide (Cook and Oettinger 1996). While human exploitation of sawfishes has been a major factor contributing to these declines, the cultural and economic value of these elasmobranchs also provide an incentive for conserving these unique batoids.

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US management of large coastal sharks

There is widespread concern among US shark scientists and the conservation community over the overfished status of large coastal sharks in the Western Atlantic and Gulf of Mexico (Camhi 1995). Large coastal sharks comprise between 75% and 92% of the annual reported US commercial shark landings in the Atlantic and Gulf (NMFS 1996). Available data indicate that many species had already declined by 50% to 75% between the early 1970s and mid-1980s. Overfishing continued through the early 1990s with the rapid expansion of the commercial shark fishery, largely in response to the increased demand for shark fins. More recently, implementation of the Fishery Management Plan for Atlantic Sharks (FMP), which has imposed an annual commercial quota and recreational bag limits on 22 species of large coastal sharks since 1993, has stemmed additional increases in shark catches (NMFS 1993). Sandbar *Carcharhinus obscurus* and blacktip *C. limbatus* sharks constitute 75%–95% of the large coastal landings, depending on location and season (GSAFDF 1996).

In June 1996, the US National Marine Fisheries Service held a scientific assessment to re-evaluate the status of these sharks. A number of disturbing trends were highlighted (NMFS 1996):

- three population models and a wide array of CPUE data sets (including fishery-dependent, fishery-independent, recreational and commercial data) confirmed that abundance in large coastal sharks had declined by 50%–80% since the early 1970s;
- although implementation of the FMP in 1993 may have stemmed the decline, there are still no clear signs that these populations have started to rebuild;
- current level of fishing mortality is about twice that necessary to produce the maximum sustainable catch; and
- demographic analyses indicate that fishing mortality exceeds – by at least twice – the maximum intrinsic rates of increase of the dominant species.

The assessment report indicates that large quota cuts – and even a closure of the large coastal fishery – will not ensure an increase in shark abundance in this century, given the low reproductive capacity of these sharks. The assessment scientists concluded that a 50% reduction or more in fishing mortality may be needed if these sharks are to begin to recover (NMFS 1996).

The Shark Operations Team (OT), an advisory panel comprised mainly of representatives from the US fishery management councils on the Atlantic and Gulf, met in August to consider the findings of the assessment and make management suggestions to NMFS for 1997. OT members recognised the need to reduce fishing mortality, but there was disagreement over the size of the quota cuts needed and what other actions, such as minimum size limits and area closures, could be implemented to offset quota reductions. Although these options have merit, they will first require rigorous scientific review to determine their value in reducing effective fishing mortality and

promoting recovery. NMFS is behind schedule in publishing a proposed rule to solicit public comment and establish management options for the large coastal shark fishery in 1997. An update on US management of this fishery will appear in a forthcoming issue of *Shark News*.

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Merry Camhi, National Audubon Society.

Red Sea and Gulf of Aden

Shark News reader Ed McManus will be travelling to the north of the Red Sea before Christmas, to look at previous elasmobranch catch data, and to the Yemen for a month from early January, to collect data on size, sex and species distributions, and the diets of elasmobranchs in these areas.

He intends to return later in order to collect data for his PhD, and would greatly appreciate receiving contact addresses in countries bordering the Red Sea and Gulf of Aden which might be able to help him with the collection of fisheries data.

Please send any information to <e.h.mcmanus@mmu.ac.uk>

As there are virtually no addresses on the *Shark News* mailing list for this area, readers are asked to send the editor addresses of any individuals, government departments or institutes in the region which might be interested in receiving this newsletter.

Rehabilitation of fisheries in Somalia

The IUCN Eastern Africa Regional Office (EARO) is coordinating the newly established Somalia Natural Resources Management Programme. The first phase of the project, a 12 month assessment and development period, funded by the European Union, aims to assist the EU develop strategies and methodologies for the conservation and sustainable use of marine and terrestrial natural resources in Somalia. The EU has received a number of project proposals for the rehabilitation of the fishery sector in the region, and is keen to provide support (particularly at the artisanal level). Shark fishing is an important activity on the coast of Somalia, with fins recognised as particularly high value products.

The IUCN Shark Specialist Group (SSG) has pointed out that it is essential for any development of shark fisheries, particularly those focused on fins, to be approached with great caution. It seems there is little or no information on shark stocks in the region. Based on suggestions from the SSG, IUCN EARO has, as a preliminary step, recommended to the EU that all EU-funded fishery projects should incorporate, as integral components of project activities, effective monitoring of fish landings through data collection on species, sizes, sex and maturity. During the course of the 12 month project period, IUCN EARO will be exploring opportunities with the EU for undertaking sampling and research activities for collecting data on Somali fish stocks. The aim is to establish a substantive basis for developing and implementing practical and locally-based management systems which reflect the socio-political reality in Somalia.

For additional information, please contact: Alex Forbes,
Coordinator of the IUCN Somalia Natural Resources Management
Programme, IUCN EARO, Box 68200, Nairobi, Kenya.
Fax: ++254-2-890615, email: amf@earo.iucn.org



Costa Rica's shark fishery and cartilage industry

Merry Camhi, National Audubon Society, USA

Introduction

As in many other countries in the world, fishing pressure on sharks in Costa Rica has grown rapidly, largely in response to the demand for fins from Asia and improved local markets for meat. Since 1991, however, Costa Rica has established itself as the global centre of production for a new shark-derived product – shark cartilage pills. Demand for cartilage has grown dramatically since 1993 as a result of (unsubstantiated) claims that consuming pills of crushed shark cartilage can help to cure cancer and a plethora of other ailments (Lane and Cormac 1992, Luer 1994).

Tracking growth in cartilage production and markets is very difficult because producers are not forthcoming with information, cartilage is shipped back and forth between countries in various stages of processing, and international trade data on cartilage is virtually non-existent. Although shark meat, fins, oil, and liver oil production are reported by the Food and Agriculture Organisation they do not report data on shark cartilage production, and few countries report their cartilage exports or imports to their customs agencies.

In 1994, an article printed in National Audubon Society's *Living Oceans News*, and later reprinted in *Shark News*, Jimenez (1994) discussed the recent growth in Costa Rica's shark fishery and cartilage industry. This article is a follow-up on the Costa Rican situation.

Booming shark fishery

According to the Costa Rican Fisheries Institute (INCOPECSA), shark landings are recorded dockside by size rather than species. "Cazon" refers to all sharks that are estimated to weigh less than 10 kg and "posta" refers to sharks that weigh more than 10 kg. Although shark fishing occurs on both coasts, the Pacific fisheries account for more than 99% of the reported shark landings. (Heads and fins are sold separately, and the viscera is thrown away at sea, so reported landings are dressed weight, which is approximately 50% of whole weight.)

INCOPECSA reported 2,455 mt of shark landings from the Pacific in 1994, of which approximately 1,500 mt were cazon and 875 mt were posta. INCOPECSA, however, estimates that reported landings are actually 20%–30% below actual catches. Therefore, total landings of sharks on Costa Rica's Pacific Coast in 1994 were approximately 3,275 mt.

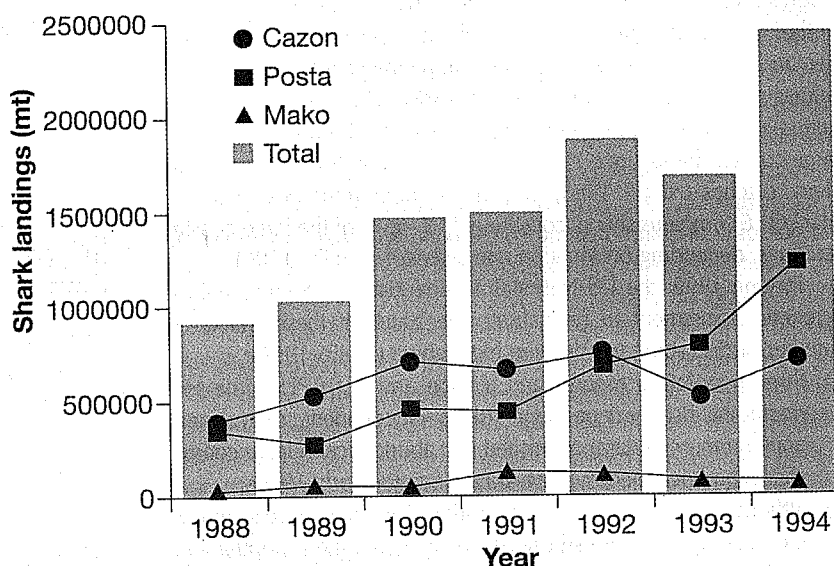
As for many other countries, shark catches in Costa Rica have grown steadily since the late 1980s (see Figure). Between 1988 and 1994, total reported landings on the Pacific Coast increased 2.7 times, from 916 mt to 2,455 mt. In addition, the average size of shark caught is decreasing: the cazon (<10 kg) to posta (>10 kg) ratio changed from 0.86 to 1.7 over the same period. Because there is no apparent reason why fishers would be targeting smaller sharks, the size trend is a strong indication that overfishing may be occurring. Apparently, the cartilage from any species of shark is used for pill production, so there are no 'preferred' species being targeted. More than 20 species of shark are being landed including *Carcharhinus falciformes*, *Prionace glauca*, *Alopias superciliosus*, *C. longimanus*, *Sphyrna lewini*, and *Cetorhinus maximus*. The average size of shark purchased by one cartilage processor is 20 kg dressed weight (dw). This suggests that more than 150,000 sharks are landed each year by Costa Rican fishers based on adjusted annual landings of 3275 mt.

This recent growth in shark fishing and landings may be due to a number of factors, including increased demand for shark fins (and possibly meat and cartilage), increased numbers of fishers and vessels on the water, and decline in traditional target species, such as swordfish, tuna, and dorado (*Coryphaena* sp.). The ratio of sharks to these other, more valuable export species is also rising. Although catch per unit effort data are not available, anecdotal evidence suggests that fishers now must travel farther and stay on the water longer than they did a few years ago and are landing only 1/3 to 1/2 of their previous shark hauls (Dold 1996).

These indicators have led to rising concern over the status of sharks in Costa Rican waters. Even more worrisome is the extent of unregulated shark fishing within Cocos Island National Park, 300 miles west of Puntarenas (B. Lavenberg, pers. comm.).

Fishers from the Pacific port of Puntarenas (the base for 60% of the country's fishing fleet) are also fishing for sharks in international waters, as well in Nicaragua, El Salvador, Panama, Colombia, Ecuador, and other countries. A video recording (February 1994) of sharks on the deck of a long-line vessel based in Puntarenas shows that Costa Rican fishers are still probably illegally taking sharks from the Galapagos Marine Resources Reserve.

Shark landings on the Pacific coast of Costa Rica, 1988–1994



Cazon are sharks weighing less than 10 kg and posta are sharks weighing more than 10 kg. Source: INCOPECSA

The cartilage boom

Until recently, shark heads were dumped overboard with the viscera. Growth in the cartilage industry, however, has led to increased retention of heads, which are kept with the torsos and fins on ice. Fins are cleaned, dried, and exported to Hong Kong, Taiwan, Singapore, and the US. The torsos are sold directly to supermarkets and seafood shops; once discarded, the shark spinal columns are now increasingly sold to cartilage processors. Spinal columns and heads are first sent to one of four locally owned cleaning plants, where the meat is removed and the spinal columns are augured. These plants then sell the cartilage to the country's largest shark buyer and cartilage processor, Corporacion Procesadora Cartilago, SA. This US-owned plant operates in a tax-free, export-only zone outside Puntarenas (which means that it must export all that it produces). In August 1994, it replaced a smaller plant owned by Shark Technology of Costa Rica that was started in 1991 by Dr I. William Lane (author of *Shark Don't Get Cancer*).

The plant cleans and sterilises the cartilage and exports it in chips to its parent company in the US, where it is further sterilised



pulverised, and packaged for sale. The processed cartilage is destined for markets in the US, Canada, Europe, Australia, and other countries. According to the Costa Rican Ministry of Foreign Trade, Corporacion exported 131,275 kg of cartilage chips between 1 August 1994 (opening of plant) and 30 September 1995. This represents a monthly average of 9,375 kg/month, up from 1,365 kg in April 1993 (Jimenez 1994).

What does this mean in terms of the number of sharks needed to support this cartilage export? Fifty kg of 'green' cartilage are required to produce 1 kg of dried, processed cartilage (Jimenez 1994). This suggests that Corporacion is buying 470 mt of green cartilage per month. Although about 4% of a shark's weight is cartilage, 'green' cartilage is probably not fully cleaned of meat and other tissue and would therefore encompass a larger proportion of total body weight. Using 10% as the 'green' cartilage to body weight conversion, suggests that about 4,700 mt of whole shark (or 2,350 mt dw) could be needed to support this one plant's monthly production of processed cartilage. This monthly figure is extremely high, given that annual reported Costa Rican landings on the Pacific Coast are only 2,455 mt dw. The discrepancy can be explained in part by the fact that Corporacion does not depend solely on Costa Rican fishers as the source for their cartilage. The plant also imports cartilage for processing from Nicaragua, Guatemala, El Salvador and Taiwan (Jimenez 1994).

Therefore, if we use an average dressed weight of 20 kg/shark, 235,000 sharks/month or more than 2.8 million sharks per year are being processed for cartilage pills in this one plant. Four other plants in Puntarenas also process cartilage for local consumption. One dealer in Puntarenas estimates that he alone provides Cartilago with cartilage from at least 111,000 large coastal sharks each year (Dold 1996).

Cartilage – a driving force behind Costa Rican shark fisheries?

The cartilage industry has created a market for a former waste product and has increased the economic value of each shark caught. Although it is clear that Costa Rican fishers are catching more sharks than ever before, it is difficult to determine how much the growing demand for cartilage has contributed to this increased fishing pressure on sharks in Costa Rica and other Central and South American waters.

It is helpful to look at the economics. In 1995, heads were selling for about US\$0.75/kg, although according to one dealer, a 22-kg shark (dw) can bring in \$8 from its cartilage. By contrast, Costa Rican fishers make US\$7–45/kg for fins. So assuming a 5% fin-to-body-weight ratio, a similar-sized shark could earn \$15 to \$100 for its fins, depending on the species. The market for shark meat is less valuable and more unstable: in 1995, meat prices fluctuated between US\$0.25 and \$1.80/kg (compared to US\$4.70/kg for swordfish). But because meat can account for more than 40% of the body weight, it can bring in \$15 as well.

Fins are clearly the most valuable shark part, but as one shark dealer in Puntarenas points out "Because they can sell everything, fisherman are dedicating themselves to sharks" (Dold 1996).



Shark cartilage products found in Europe in 1996 during the TRAFFIC study of world trade in sharks. Photo: Elizabeth Fleming, TRAFFIC Europe.

Although most Costa Rican long liners still take sharks as bycatch, some fishers now target sharks. Questions remain concerning the fate of previously released small sharks or those of species not used for their fins; that is, are fishers now landing any and every shark they catch?

It is estimated that up to 100,000 people are currently using cartilage for cancer or as a dietary supplement (Dold 1996). Given the rapid rate of growth in the consumption of cartilage pills, the growing interest in alternative health products, and the size of the potential markets for such products, demand for cartilage is likely to grow and the value of cartilage may grow with it. Although cartilage may not replace fins as the most valuable shark product, it is clearly raising the overall value of each shark caught.

It is unlikely that shark cartilage is the driving force behind the Costa Rican shark fishery, but it could be leading to even higher fishing pressure. Shark fisheries are wholly unregulated in Costa Rica and there have been few studies of Costa Rica's sharks or the impact of increased fishing pressure. As demonstrated repeatedly, growing demand and growing profits make it increasingly difficult to implement precautionary and effective management, especially in export-driven fisheries.

Few fishers, shark scientists, or fishery managers would have predicted the rapid growth in shark fisheries in the late 1980s and 1990s that resulted from the growing demand for shark fins in the Asian markets. Reducing waste through full utilisation is laudable, but ensuring that shark populations can sustain the increased demand for new products like cartilage is more critical.

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(Much of the information presented in this article was collected on behalf of the National Audubon Society by a source who asked to remain anonymous.)

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European Elasmobranch Groups

Deutsche Elasmobranchier-Gesellschaft (DEG)

The German Elasmobranch Society (DEG) was founded in Hamburg on 28 October 1995 by a group of seven scientists, journalists and amateur shark enthusiasts. It is a non-profit-making registered Society under German law, and now has about 60 members, including three corporate members representing other societies. This is not just a society for academics, but also for marine scientists, students, sports divers, anglers, yachtsmen and all members of the general public concerned about the conservation of marine life in general and elasmobranchs in particular.

The DEG will address its activities primarily to the German speaking public in Europe, with the aims of providing information and education regarding chondrichthyans and supporting necessary fishery management and conservation measures. However, the Society will also cooperate with equivalent national and international organisations involved in research and conservation of chondrichthyan fishes.

The German language Newsletter *Elasmoskop* (35 pages) is published twice a year in June and December. *Elasmoskop* 2/96 is due out this month.

Requests for information should be addressed to the Vorstand (executive committee),

Deutsche Elasmobranchier-Gesellschaft e.V.,
c/o Zool. Museum der Universität Hamburg,
Martin-Luther-King-Platz 3,
D-20146 Hamburg, Germany
(fax: + 49 40 4123 3937)

First anniversary of Italian elasmophile group

The first meeting of a group of Italian elasmophiles was held on 2 December 1995 at the City Aquarium, Milan. The meeting provided the occasion for a number of scientists active in elasmobranch research in Italy to present the results of their studies (including: occurrence of large elasmobranchs in the Tyrrhenian and Ligurian Seas and in the Sicily Channel; presence in Italian waters of the great white shark; blue shark and thresher shark by-catch in the southern Adriatic Sea; aspects of the reproductive biology and feeding ecology of blue sharks in the northern Adriatic Sea; tagging programmes of blue sharks in the Adriatic Sea; blue shark morphometric studies; and occurrence of organochlorine compounds in elasmobranch tissues).

These contributions will be published in Italian and English in the *Quaderni della Civica Stazione Idrobiologica di Milano*, the scientific periodical of the City Aquarium. During the meeting, this informal group unanimously adopted the decision to eventually become the Italian branch of the European Elasmobranch Association.

For more information, please contact:

Giuseppe Notarbartolo di Sciarra, Tethys Research Institute, viale G.B. Gadio 2, I-20121 Milano, Italy.

Fax (+ 39) 2 72001946, email: gnstri@imiucca.csi.unimi.it

European Elasmobranch Association launched

The European Elasmobranch Association (EEA) was launched on 25 October at an evening meeting in the National Sea Life Centre, Birmingham. This is a non-profit body which is intended to coordinate the activities of all European organisations dedicated to the study or conservation of sharks and rays. It seeks to advance research, sustainable management, conservation and education throughout the region. Some of its priorities are:

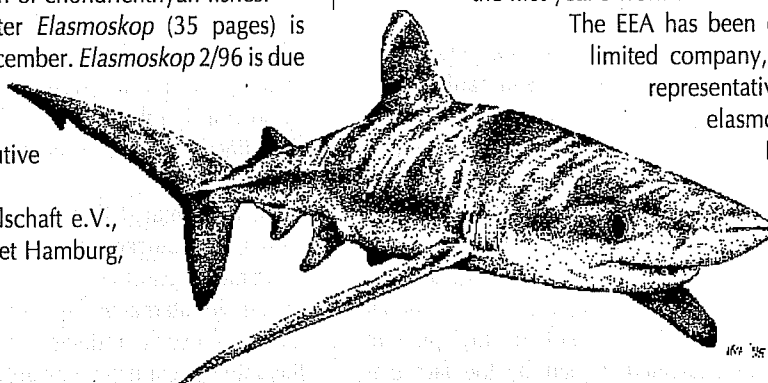
- Introducing effective management on a regional basis to regulate shark and ray fisheries and ensure their sustainability.
- Reducing shark and ray bycatch and mortality in other fisheries.
- Improving records of catches, landings and international trade.
- Increasing research effort on the biology of sharks and rays and impacts of fisheries.
- Improving management of threatened elasmobranch habitats.
- Providing information to the public and decision-makers.

A member of the German Elasmobranch Society (DEG) presented a letter of congratulations from their president. There were also representatives present from the Italian Elasmophile Group, the Netherlands Institute for Sea Research, and the UK *ad hoc* Shark Working Group, other founding partners in the EEA. The UK partner organisation (to be named the Shark Trust or Shark Fund) is still seeking charitable status and is therefore not yet formally established.

Representatives of three of the four organisations grant-aiding this initiative were present: Scottish Natural Heritage, English Nature and WWF (UK). The Countryside Council for Wales is also helping to fund the first year's work of the Association.

The EEA has been established as a non-profit limited company, and will be managed by representatives of each share-holding elasmobranch group in Europe.

Participating shares are also available for purchase by other organisations interested in the objectives of the EEA. All share allocations must be approved by the Board.



Individuals wishing to support the EEA may subscribe directly (contact details below). Subscribers will also receive a regular newsletter and invitations to attend regular meetings of the Association.

Further details are available from: The European Elasmobranch Association, 36 Kingfisher Court, Hambridge Road, Newbury, Berkshire, RG14 5SJ, UK. Tel: +44 (0)1635 550380. Fax: +44 (0)1635 550230. Email: shark@naturebureau.co.uk

Third European shark and ray meeting

The third European shark and ray meeting took place in Birmingham on 26–27 October 1996. Nearly 100 participants from 12 countries heard papers on a wide range of aspects of elasmobranch reproduction, evolution, research in the field and laboratory (including tagging programmes run by scientists and amateurs), behavioural ecology (of white sharks), fisheries research and management, conservation initiatives and international trade. Highlights of the meeting included presentations from speakers from the USA and South Africa, invited by the sponsors, the Sea Life Centres (UK). Gordon Croft (Sea Life Centre, St Andrews, Scotland) is to be congratulated on organising an excellent meeting.

Authors have been asked to submit copies of their papers, so that copies of the proceedings can be made available (*Shark News* will publish details when available).

Three photographs are available showing participants at the meeting. Lack of space prevented them from being reproduced here – we will try to print them in a future issue or EEA newsletter. Contact the photographer, Richard Lord, if you would like to obtain copies (Sealord House, Montville Road, St Peter Port, Guernsey, GY1 1BQ, Great Britain. Fax: + 44 (0)1481 700699, email: fishinfo@itl.net).



Sarah Fowler

Protection of chondrichthyan fishes, Israel

All chondrichthyan fishes are considered protected species in Israeli waters (both Red Sea and Mediterranean). However, there are now moves to remove commercially valuable sharks from the protected list. The Shark Specialist Group was recently contacted by the Nature Reserves Authority, Israel, with a request for advice on which species or families might 'safely' have their protection removed, and which most required continued protection.

There is no information yet available on the distribution and population sizes of sharks in Israeli waters. The Nature Reserves Authority will be trying to obtain data on local populations of species considered for commercial exploitation before suggesting whether their protected status may safely be recinded.

High mercury levels in shark's fin

The *Hong Kong Standard* reported in October that samples of shark fin bought from Hong Kong wholesalers and tested in the US were found to contain up to 5.84 ppm of mercury (maximum permitted levels in Hong Kong are only 0.5 ppm). This is not surprising: as top predators, sharks readily accumulate heavy metals through the marine food chain. Indeed, in 1972 the sale of large school sharks *Galeorhinus galeus* was banned in Victoria, Australia, because of their high mercury content.

The newspaper article also pointed out that scientists and medics recognise that mercury may be a cause of subnormal sperm counts in man. Perhaps wider awareness of this possible link between the excessive consumption of shark fin soup and male infertility could help to reduce the demand for shark fin in international trade?

New record of pregnant white shark, Kenya

A 21 foot long pregnant white shark was netted 5 miles off Malindi, Kenya, in early August. The female was carrying five young when cut up and sold. It was too large to weigh intact, but was estimated at some 5,000 lb (the head and pectoral fin alone was 1,000 lb, and the liver about 400 lb). A plaster cast of the head will be put on display at Hemingways Hotel, Watamu. Two smaller white sharks were landed in the previous fishing season – all were taken by commercial fishermen.



Regional IUCN staff report that large hammerheads and tiger shark are also landed from the Pemba Channel (between Pemba Island and the Tanzania mainland, some 250 km south of Malindi) and suggest that this area could be an important pupping ground for these large sharks.

Wanted: basking shark tissue samples

A team at Durham University is developing a DNA library and microsatellite sequences to study the population genetics of basking sharks, compare Atlantic and Pacific populations, localised groups in Europe (Portugal to Norway) and determine the genetic stock structure of the Atlantic population as a whole. This should provide a sound basis for conservation and management of the species. They have tissue samples from the UK, but would like to hear from anyone who knows areas where basking sharks occur regularly, or could provide tissue samples from anywhere in their global range. They are keen to collaborate with others and would provide full genetic analysis of samples. Please contact Tim Thom, Dept. of Biological Sciences, University of Durham, South Road, Durham, DH1 3LE, England. Tel: +44 91 3747407, fax: +44 91 3742417, email: t.j.thom@dur.ac.uk

Eyewitness Shark video

The publishing company Dorling Kindersley are now moving into the video market. They have produced, in collaboration with BBC Television, a 28 minute video based on their *Eyewitness Shark* book. This presents a fast-moving mixture of excellent natural history footage (from the BBC) with impressive graphics, covering a range of material from the factual (biology, evolution, ecology and scientific research) to human uses, shark attacks (inevitably rather gory at the outset, but put into perspective later), history, myth and legend. There is some wonderful behavioural footage (not just feeding, but also mating and birth). The video does not only cover the obvious (e.g. white and whale sharks), but also the more obscure and unusual, from hornshark to angel shark and megamouth. Finally, it doesn't only concentrate on sharks, but rays (including sawfishes) and chimaeras also get a reasonable showing. The conservation message is strong. While I am admittedly not an expert on the range of educational videos now available, I was impressed. *Sarah Fowler*.

Subscribers to Shark News

New readers wishing to continue to receive *Shark News* should return the slip below, with their name and address clearly printed.

We greatly welcome all personal contributions towards the cost of printing, mailing, and other Shark Group work, although we cannot presently afford to manage a formal subscription for the newsletter (this would probably cost more to administer than we will receive, particularly when handling foreign currency). Invoices for subscriptions (£5.00 per issue) can be sent to organisations or libraries unable to contribute without a formal request for payment.

Donations may be made as follows:

1. by cheque or Bankers Order in US\$ to Sonja Fordham at the Center for Marine Conservation (marked payable to "CMC – Shark Specialist Group, account number #3060"), or

2. by cheque or Bankers Order in £ sterling to Sarah Fowler (payable to the "Shark Specialist Group"), or

3. by credit card. Send details to Sarah Fowler.

All addresses are given below.

Finally, please send any comments on the newsletter and suggestions for articles for future issues to the editors, Sarah Fowler or Merry Camhi (address on the back page).

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or (with donations in US\$) to: Sonja Fordham, Center for Marine Conservation, 1725 DeSales Street NW, Washington, DC 20036, USA.

Nearly everywhere, fisheries that have sustained coastal

communities for generations have suffered catastrophic declines. In some areas, excessive fishing has driven staple species such as Atlantic cod commercially extinct. Increasingly volatile 'fish wars', such as the dispute last year between Canada and Spain, have erupted over remaining stocks. Governments pay an estimated \$54 billion per year in fisheries subsidies to bolster a faltering industry. These payments sustain massive fishing fleets that continue to catch fish at an alarming rate. Huge, sophisticated vessels able to stay at sea for months seek fisheries farther and farther afield, often in the waters of developing countries.

To make matters worse, evidence is mounting that fisheries significantly affect the ocean environment and represent a serious threat to marine biological diversity. Indiscriminate fishing practices kill and waste an average of 27 million metric tons of unwanted fish, seabirds, sea turtles, marine mammals, and other ocean life annually – fully one-third of the world catch. Unsustainable, 'dirty' fishing has literally become an industrial addiction.

Fishery managers have been unable to prevent the 'mining' of fishery resources. Typically, the short-term social and economic needs of a region's commercial fishing industry have rendered long-term sustainability of healthy catches a futile management goal. All too often, political realities have compelled managers to ignore the implications of the best available science. Politicians, often at the highest levels, frequently intervene in fisheries management decisions. Society has simply lacked the political will to forestall the fishing industry's tendency to use up its capital and thereby destroy itself.

For further information, please contact Mike Sutton, fax: (+44) (0)1483 426409, tel: ++ 426444, email: 102060.343@compuserve.com

The Shark Specialist Group gratefully acknowledges the sponsorship of the WWF's Endangered Seas Campaign and donations towards the production of *Shark News* and other work of the Group received from a number of individuals (see next issue).

WWF's Endangered Seas Campaign



To help alleviate the global fisheries crisis, WWF launched a new, world-wide campaign in July 1995 to promote the conservation and sustainable use of marine fisheries. The campaign is working to build the necessary political will around the world to end chronic overfishing, revitalise devastated fisheries, improve management regimes, and reduce the use of destructive fishing gear and practices. The goal is to halt and reverse the effects of unsustainable fishing on marine fishes and the ocean ecosystems on which they depend.

The campaign has three principal targets:

1. To establish effective recovery plans for key threatened species – tunas, swordfish, marlins and sharks.
2. To create powerful social and economic incentives for sustainable fishing.
3. To reduce or eliminate the bycatch of marine wildlife in commercial fishing operations.

In 1996, the Endangered Seas Campaign supported and helped launch TRAFFIC's report on the world-wide trade in shark parts and products. The centrepiece of the campaign is the Marine Stewardship Council (MSC) initiative, launched in early 1996 in partnership with Unilever, the world's largest buyer of frozen fish. To be established in 1997, the MSC will harness market forces and consumer power in favour of sustainable fisheries through independent certification and ecolabelling of seafood products.

Reversing the fisheries crisis won't be easy: fish neither sing like whales nor look like pandas. But the stakes are high: the future of world fisheries, their associated marine ecosystems, and the millions of people that depend on them for food and employment.

Meetings

IX Societas Europaea Ichthyologorum Congress Theme: Fish Biodiversity

Maritime Station, Trieste, Italy. 24–30 August 1997. Contact Pier Giorgio Bianco, Dipartimento di Zoologia, Via Mezzocannone, 8, I-80134 Napoli, Italy. Fax: + 39 81 552 64 52.



5th Indo-Pacific Fish Conference

ORSTOM Centre, Noumea (New Caledonia). Early November 1997. A symposium will be devoted to Chondrichthyan fishes. Contact the URL at <http://www.mnhn.fr/sfi/Congres/IPFC5.html>, or B. Séret, Antenne ORSTOM, Muséum National d'Histoire Naturelle, Laboratoire d'Ichtyologie, 43 Rue Cuvier, 75231 Paris cedex 05, France. Fax: (33) 1 40 79 37 71. Email: seret@mnhn.fr.

Editorial details

Shark News aims to provide a forum for exchange of information on all aspects of chondrichthyan conservation matters for Shark Group members and other readers. It is not necessary to be a member of the Shark Specialist Group in order to receive this newsletter.

We will publish articles dealing with shark, skate, ray and chimaeroid fisheries, conservation and population status issues around the world; circulate information on other relevant journals, publications and scientific papers; alert our readers to current threats to chondrichthyans; and provide news of meetings. We do not publish original scientific data, but aim to complement scientific journals. Published material represents the authors' opinions only, and not those of IUCN or the Shark Specialist Group.

Publication dates are dependent upon sponsorship and receiving sufficient material for publication, usually three issues per annum.

Manuscripts should be sent to the editors at the address given on this page. They should be composed in English, legibly typewritten and double-spaced (generally 750–900 words, including references). Word-processed material on IBM-compatible discs would be most gratefully received. Tables and figures must include captions and graphics should be camera-ready.

Author's name, affiliation and address must be provided, with their fax number and email address where available.

Enquiries about the Shark Specialist Group and submissions to *Shark News* should be made to:

Newsletter Editor and Shark Specialist Group Acting Chair
Sarah Fowler

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