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CITES action for Sharks

Sonja Fordham, Centre for Marine Conservation

Last year's meeting on the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), held in Fort Lauderdale, Florida, proved to be a pivotal event for sharks when a resolution to improve international shark data collection received unanimous approval.

The resolution was prompted by the growing recognition of the plight of many shark species. Once considered "under-utilised" resources, increasing numbers of shark populations world-wide now face over-exploitation and severe depletion as markets for shark meat, fins, and cartilage expand. Conservation and management efforts for sharks have historically been hampered due to lack of data.

Initially, the resolution was introduced by the United States and, after some debate, was sent to a working group made up of interested delegates and conservationists from around the world. After spirited deliberation, the working group produced a reworked resolution which presented a compromise between interests from several countries, including the US, Japan and Panama. The revised document was then re-introduced and passed without opposition.

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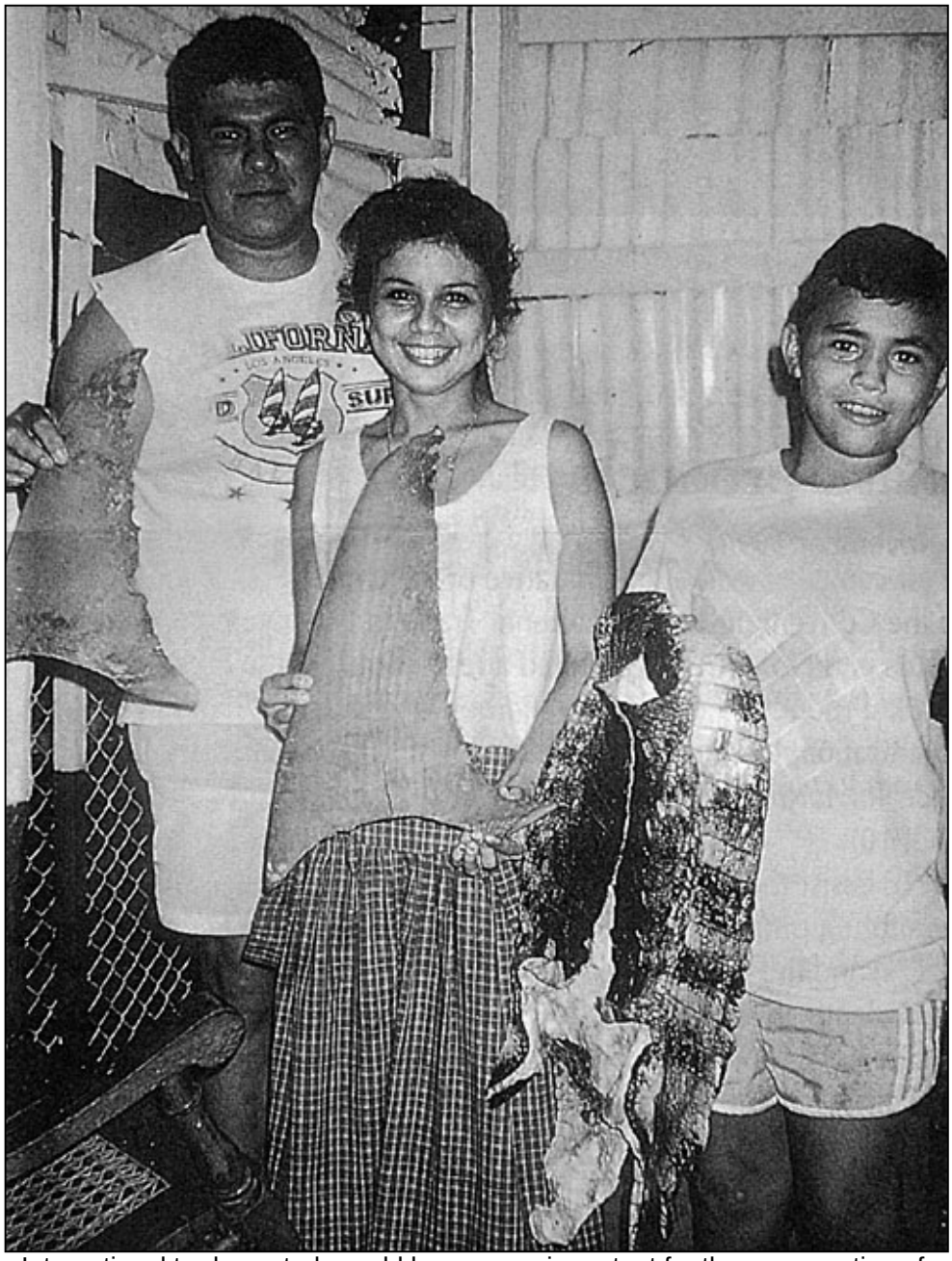

International trade controls could become as important for the conservation of some sharks as they are for the survival of reptiles. Photo: Carl Safina.

Entitled "The Status of International Trade in Shark Species", the resolution calls for the Animals Committee of CITES to review all information concerning the biological status of sharks and the effects of international trade, and submit a report to the next Conference of the Parties to CITES in the spring of 1997. In addition, the resolution requests that the Food and Agricultural Organisation of the United Nations and other international fishery organisations improve their research programs and submit new information on these topics to the 11th Conference of the Parties in the fall of 1999. The Centre for Marine Conservation (CMC) will contribute to this endeavour by teaming up with TRAFFIC, the wildlife trade monitoring arm of the World Wide Fund For Nature, to produce a report on the international trade in sharks fins. Research for the report will begin this year (see article on page 2).

Considering CITES' inaction for marine fish to date, passage of this resolution was remarkable. Only five species of marine fish (three species of anadromous sturgeons, the coelacanth and the totoaba) are currently included in the CITES Appendices, and this was the first time that shark issues have earned consideration by the CITES delegates.

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Advocacy and educational efforts by a number of conservation groups helped to convince the delegates of the need for improved shark data collection on a global scale. On the opening day of the meeting, the CMC distributed a four page fact sheet on the need for international shark conservation to all the delegates. During specialist group, delivered an eloquent and persuasive statement on behalf of imperilled shark populations. The World Wide Fund For Nature, TRAFFIC, the National Audubon Society and the CMC participated in the working group which drafted the compromise resolution. The shark activities concluded with conservation groups joining members of the US delegation in a press conference announcing the resolution.

Improved data collection on shark fisheries, trade and population status is the critical first step toward implementing international shark conservation and management. This important action also lays the groundwork for future efforts to use CITES to regulate trade and conserve these vulnerable species.

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International trade in sharks and shark products

In November 1994, at the initiative of the United States, the Parties to the Convention on International Trade in Endangered Species of Fauna and Flora (CITES) adopted a resolution, "Trade of Sharks and Shark Products," calling on Parties and international fisheries organisations to improve the collection of data on shark fisheries and trade for further discussion at the next Conference of the Parties (COP10).

To assist these efforts, TRAFFIC, an international wildlife trade monitoring program established by the World Conservation Union (IUCN) and the Worldwide Fund For Nature (WWF), will undertake an in-depth investigation of the global trade of sharks and shark products. The objective of the project is to compile information from field and market research needed to develop a comprehensive understanding of the shark trade, its impacts on shark stocks, and actions needed at the national and international levels to address the unsustainable exploitation of shark fisheries. The TRAFFIC Network study will be conducted in cooperation with the CITES Secretariat and Animals Committee, IUCN, and other agencies and organisations. The results of the 18-month study are scheduled to be released prior to the discussion of shark trade at the Tenth Conference of the Parties to CITES.

Call for information
TRAFFIC is currently calling for any available reports, news items, or other information on international trade in sharks and shark products. Contact Glenn Sant, TRAFFIC Oceania, P.O. Box R594, Royal Exchange, Sydney N.S.W. 2000 Australia. Tel.: (+61) 2-2478133. Fax: (+61) 2-2474579, or Andrea Gaski, TRAFFIC USA, 1250 Twenty-fourth Street N.W., Washington, D.C. 20037 USA. Tel.: (+1) 202-775-8287.

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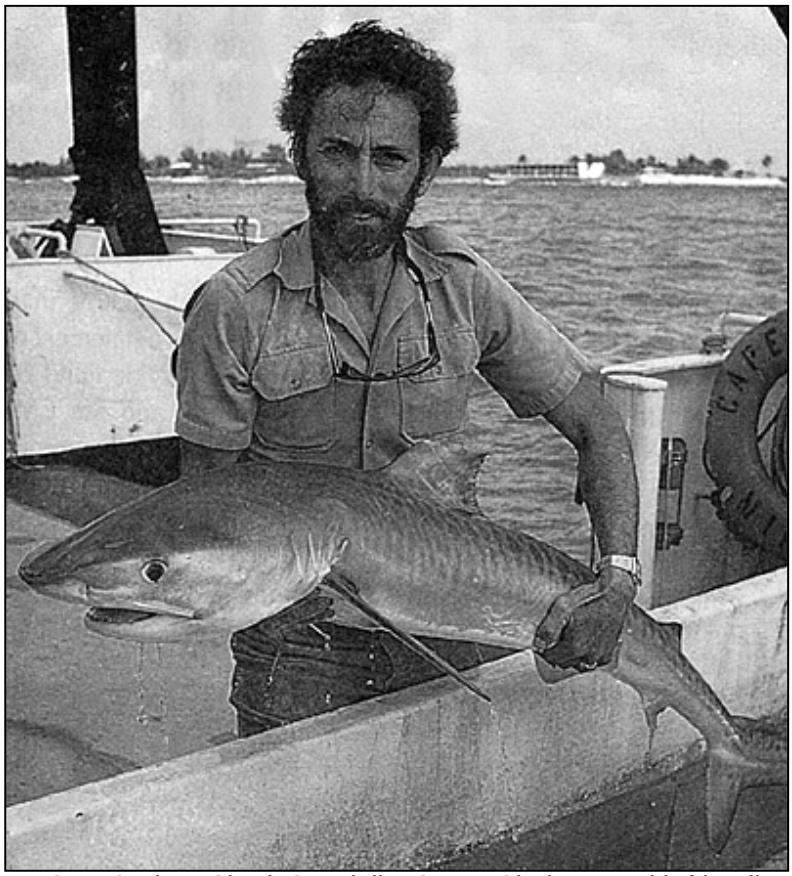
Chairman's message to the Shark Specialist Group

I first became seriously interested in shark conservation when, in 1988, I was forced to abandon a six year study of juvenile lemon sharks after they slowly but relentlessly disappeared from the Florida Keys. I wrote a few angry articles and appeared in some media presentations railing against this senseless slaughter. Imagine my surprise when, two years later George Rabb, Chairman of the IUCN Species Survival Commission asked me to establish and chair a Shark Specialist Group (SSG). Never mind that I had no special knowledge of conservation principles, George said the time was right and that I could do it.



Dr S.H. Gruber, Shark Specialist Group Chairman, with friendly tiger shark.
Photo: © Jeremy Stafford-Deitsch

In hindsight, organising and running the SSG has been like an emotional roller coaster. The initial optimism at the thought of our group changing the world gave way to mild concern at the reality of the situation and finally to pessimism and even depression

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when funding failed to materialise concurrent with the logarithmic increase in the killing of sharks.

Yet the gloom was punctuated by feelings of elation at some hard won victories: The passage of the US Atlantic Shark Management Plan, the protection of white sharks and the banning of long line gear and drifting gill nets in many places.

Today, because of interest in sharks and their conservation as exemplified by the many television programs, newspaper articles, magazine stories and most importantly the flurry of resolutions at the recent CITES convention, we are in a period of intense optimism - up on a high!!

Looking back over the work of our group, I am proud of our many VOLUNTEER accomplishments: three international meetings punctuated with scholarly reports, obtaining meagre funds by helping produce a CD-ROM on sharks with conservation overtones, producing and distributing a slide set for use in public lectures on shark conservation, making good progress on the Action Plan, including a full blown proposal for its funding, and forming a coalition to ban the use of long line fishing in the Bahamas ... and getting long line gear banned. Possibly most important, we have raised consciousness for shark conservation on a world-wide basis,

The founding and funding of this newsletter, *SHARK NEWS*, is testament to our deputy chairwoman, Sarah Fowler, who among all our diligent members makes the greatest effort and has enjoyed the highest productivity. She has earned my deep respect and gratitude.

But there have been failures as well. On a personal level, I had hoped that the SSG would take the leading role in global shark conservation. That did not happen. We have not even been able to attract sufficient vice chairpersons to cover every part of the world's oceans. And of course my funding record has been dismal. I must take full responsibility for these problems because I failed to exercise the leadership to get the job done.

Nevertheless, our future is bright; but we must seize the opportunity! I am certain funding the work of the SSG is far more likely in today's climate, and we have several grant applications in the pipeline.

I believe our first priority is to complete the Action Plan. Simultaneously, we must identify priorities as regards research and conservation goals. And finally we must vigorously pursue our CITES petition for 1997, In the end we just might really make adifference after all.

Samuel H. Gruber
Chairman, Shark Specialist Group

The IUCN/SSC Shark Specialist Group

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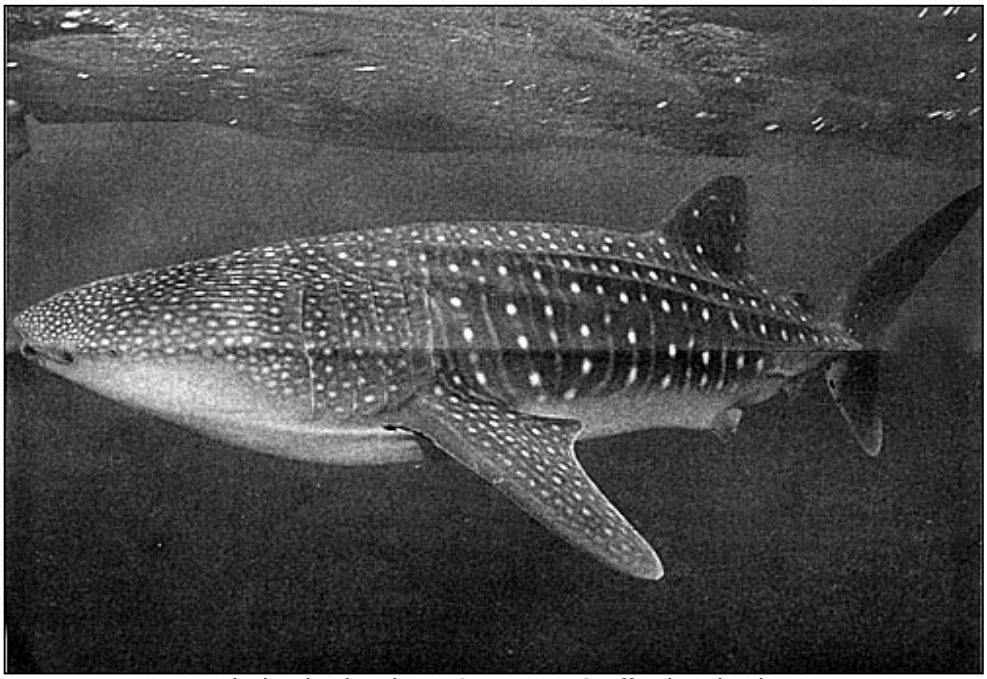
Whale sharks in Western Australia

John Stevens, CSIRO Australia

Over the last few years a significant ecotourist industry based on snorkelling with whale sharks has developed at Ningaloo reef in north Western Australia. Each year during March and April, aggregations of these sharks appear close to the reef which is only a kilometre or so offshore. During the whale shark season the normally quiet town at Exmouth comes alive with international tourists and television crews wanting to swim with and film the whale sharks. Spotter planes are used to locate the sharks and direct the dive-boats into contact. Management regulations control the number of vessels in the area and in contact with a particular shark, the number of snorkellers in the water and contact time and minimum approach distances in an attempt to minimise disturbance to the animals. Other than that the whale sharks presence in the area is most probably in response to increased productivity in the food chain associated with the mass spawning of corals, little is known of their local population structure, behaviour and movement patterns.



Whale shark. Photo © Jeremy Stafford-Deitsch.

Last March myself and John Gunn, also from CSIRO, spent ten days at Ningaloo doing some tracking and tagging work to try and find out more about the whale sharks movement patterns. We looked at short term movements using standard acoustic telemetry techniques and long term movements using recently developed archival tags

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('smart' tags or data loggers). John Gunn is heading up a CSIRO project which has developed and pioneered the use of these tags on southern bluefin tuna. The tags were designed by CSIRO in conjunction with a local electronics company and they measure and store information on the date, time, swimming depth, light levels and temperature of the surrounding water. Data are collected at predetermined intervals and logged for 8-9 years and can be stored for up to 20 years. On retrieval of the tag the data are downloaded and the light intensity data used to calculate geographical locations of the fish providing a record of where it has been overthat period accurate to about one degree of latitude and longitude. The tags measure 90 x 24 x 18 mm, weigh 60 g in air and have 256 kilobytes of RAM memory, enough space for some 60,000 sets of data on depth, water temperature, light levels and time. The tags are expensive and consequently only cost effective where high recapture rates can be expected. In the case of whale sharks at Ningaloo it is known from individuals with distinctive markings and fin damage that many of the same sharks return each year.

Both the acoustic transmitters and the archival tags were attached to the sharks' first dorsal fin using a small detachable stainless steel head mounted on a spear which was propelled using a Hawaiian sling. Tagging was carried out underwater by a snorkeller with the shark usually showing little or no reaction to being tagged. During our visit we saw some 35 whale sharks. Two individuals were tracked, one for a period of 26 hours, providing interesting data on horizontal movements along the reef, diving behaviour, the time spent at different positions in the water column during the day and night, and on swimming speed. Six archival tags were attached (one was retrieved after 24 hours providing further data on swimming depth and diving behaviour) and we are hopeful of getting at least one back this year which would provide fascinating information on where the sharks have been after leaving Ningaloo.

This year we hope to go back and do some more tracking work, deploy more archival tags and also try some satellite tracking.

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Regional whale shark news

Whale sharks protected in Maldives
Fishing for whale sharks was banned in Maldivian waters from the end of 1993. This was in recognition of their rare status in the Maldives, the low monetary value of the seasonal fishery (which took between 20 and 30 fish a year, worth less than US $1,500), and the possible benefits of the species to the tuna fishery (fishermen report an association between whale shark and tuna schools) and the tourism industry. The protection of the species in the Maldives is to be welcomed, since fishermen have reported a decline in catches there over the past ten years.

Charles Anderson

Whale shark aggregations on the Kenya coast
An IUCN/Kenya Wildlife Service air survey took place in November 1994, primarily to determine the occurrence and distribution of dugongs, turtles and cetaceans on the Kenya coast. Between 60 and 80 whale sharks were also sighted, clustered along the coast rather than evenly distributed, with some right over coral reefs and others a considerable distance offshore (the data are being entered into ArcInfo and are not yet ready for analysis). There were also interesting observations of large hammerheads and aggressive encounters between Zambesi River/bull sharks *Carcharhinus leucas* and spotted dolphins *Stenella attenuata*.

Maps showing the numbers and distribution of the whale shark sightings relative to the position of coral reefs and bathymetry, and a survey report will be available from the Kenya Wildlife Service by the end of February. The IUCN Eastern Africa Regional Office and Shark Specialist Group experts are evaluating the importance of these records and will be making recommendations forfurther research and conservation action.

Rod Salm
Marine & Coastal Conservation Programme Coordinator
IUCN Eastern Africa Regional Office

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Freshwater elasmobranchs; a questionable future

Leonard I.V.Compagno, Shark Research Center, South African Museum,
and Sid F. Cook, Argus-Mariner Consulting Scientists

Living cartilaginous fishes include approximately 923-1117 species in 171 genera and 55 families (estimate from 22 January 1995). Of these about 43 species of elasmobranchs (mostly rays but with a few sharks) in four families and ten genera are found in freshwater far beyond tidal influences. Some chimaeras occur inshore in enclosed marine bays but do not tolerate fresh water.

Freshwater elasmobranchs (excluding marginal species)

BRACKISH MARGINAL SPECIES:
Whiptail stingrays, Family Dasyatidae: *Himantura* (1 species).

EURYHALINE SPECIES:
Requiem sharks, Family Carcharhinidae: *Carcharhinus* (1 species), *Glyphis* {2 species?).
Sawfishes, Family Pristidae: *Anoxypristis* (1 species?), *Pristis* (5 species).
Whiptailed stingrays, Family Dasyatidae: *Dasyatis* (2 species), *Himantura* (2 species?), *Hypolophus* (= *Pastinachus*, 1 species).

OBLIGATE FRESHWATER SPECIES:
Requiem sharks, Family Carcharhinidae?: *Glyphis* (1 species?).
South American river stingrays, Family Potamotrygonidae: *Paratrygon* (1 species), *Plesiotrygon* (1 species), *Potamotrygon* (18 species).
Whiptailed stingrays, Family Dasyatidae: *Dasyatis* (4 species), *Himantura* (4 species).

Geographic distribution
Freshwater elasmobranchs are found in tropical and warm-temperate rivers and lakes and inshore marine waters (euryhaline species) or are confined to brackish waters (brackish-marginal species) or fresh waters (obligate freshwater species). At least 25 additional species of sharks and rays (marginal species) penetrate fresh water in estuaries or river mouths but are not found far from the sea. Some freshwater elasmobranchs occur or occurred in warm-temperate rivers such as the Mississippi River in the USA or the rivers of Natal in South Africa, but most occur in the tropics of both hemispheres.

The greatest diversity and endemism of freshwater elasmobranchs occurs in the Atlantic drainages of South America with its radiation of river stingrays (Family

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Potamotrygonidae), but pockets of endemism and diversity also occur in West Africa and in Asia (the Indian subcontinent eastward through Southeast Asia, southern China, Indonesia, New Guinea, the Philippines, and Australia. Freshwater elasmobranchs also occur in the Tigris River system of southern Iraq, from several other rivers in Africa, North America, and from southern Europe (Portugal) and rivers draining into the Mediterranean Sea.

The tropical rivers and lakes where most freshwater elasmobranchs occur are mostly in developing countries with enormous, expanding human populations. Increasing levels of direct exploitation and modification or destruction of riverine and lacustrine ecosystems, especially where uncontrolled human population growth isoccurring, threaten many freshwater elasmobranch stocks and obligate freshwater soecies with extinction.

The plight of freshwater elasmobranchs

Unfortunately freshwater elasmobranchs are not well-know biologically, and have been little studied in terms of fishery management or conservation. Although freshwater elasmobranchs were known for the past few centuries, their dire plight has only been recognised in the past three decades. Only a handful of researchers (most notably Prof. T. Thorson), have paid much attention to their problems.

Freshwater elasmobranchs have all the biological constraints of marine elasmobranchs, including low fecundity, late sexual maturation, long life, and intermittent breeding. In addition, they are limited by habitat limitations that usually do not affect marine elasmobranch populations. They inhabit physically restricted environments (rivers, streams, bayous, estuaries, and lakes) which greatly limit escape from pollutants, habitat modification and destruction, or directed and incidental capture in fisheries.

Due to habitat constraints, freshwater elasmobranchs are probably less capable of withstanding sustained human impact than more fecund freshwater bony fishes or marine elasmobranchs. Also, human impact may be more severe because of the protected nature of freshwater ecosystems, which allow use of simple forms of fishing gear, vessels and impoundments of little use in marine waters. Lakeside and riverside sites have been favoured habitats of *Homo sapiens* for millennia, because they provide easy access to supplies of water, food, and avenues of transport for commerce.

Restricted habitats

Rivers and lakes are more limited in volume, and very probably in range of habitats that are exploitable by elasmobranchs, than the sea. Freshwater habitats tend to be far less stable than marine equivalents. Shortand long-term fluctuations in temperature, oxygen level, mineral content, turbidity, water flow, rainfall, and major changes in river and lake beds can readily exceed the tolerance of elasmobranchs. Added to natural problems are escalating human-induced problems such as dam-building and other modifications of water courses, fisheries, use of water for irrigation, and an ever-increasing variety and volume of pollutants.

Fresh water may be a marginal habitat for elasmobranchs, as suggested by their low taxonomic, ecological, and morphological diversity compared to freshwater bony fishes and marine cartilaginous fishes. Freshwater elasmobranchs are collectively large animals compared to most freshwater bony fishes, which correlates with their low diversity and habitat specialisation. Elasmobranchs apparently are not competitive in microniches open to small-sized (less than 150 mm total length) fish-like vertebrates at present, and teleosts utterly dominate these niches in fresh water.

Freshwater elasmobranchs are apparently restricted to mostly permanent and relatively large, placid lakes, rivers and large streams with egress to the sea, and are notably absent from more extreme freshwater habitats successfully colonised by bony fishes and by many other aquatic vertebrates. Freshwater elasmobranchs are obligate-aquatic gill-breathing animals that are restricted to well- aerated permanent water and have no ability to breath air directly, to transport themselves out of water, to penetrate major rapids and waterfalls, to aestivate in burrows, orto survive as fertilised eggs

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when bodies of water become anoxic or dry up. Sea access is vital to certain euryhaline elasmobranchs that range widely in fresh water but cannot reproduce there.

No euryhaline elasmobranchs that reproduce in fresh water and no obligate freshwater elasmobranchs are confined to naturally landlocked bodies of water so far as is known. Perhaps conditions in landlocked rivers and lakes can become more extreme than unmodified sea-run rivers and lakes. These conditions could exceed the tolerance of freshwater elasmobranchs that are trapped in land-locked waters by geological or human-induced events, and cause their extirpation.

Fisheries and other impacts

Although freshwater elasmobranchs were recorded from catches since the early 19th century, very little is known to date of the nature of these fisheries. From the 17th to the 19th century the human impact on freshwater elasmobranchs was probably very low, due to a much smaller world population and small and scattered human populations in most of the tropics, as well as slow spread of the Industrial Revolution from its birthplace in Europe to the rest of the world. The impact of humans upon freshwater elasmobranchs 300 years ago was probably small, limited almost exclusively to small artisanal fisheries for food and other minor products. This changed substantially during the twentieth century with human population tripling, the development of very high human population growth rates in the tropics, and a massive push for resource exploitation and industrialisation in tropical countries.

Now the impact is massive, multifaceted, and includes overfishing of elasmobranchs, marked increases in habitat modification, degradation or destruction, introduction of exceptionally toxic substances from industrial and agricultural activities as well as large volumes of raw sewage and other human wastes into rivers and lakes.

Deforestation proceeds on a massive scale in tropical countries, increasing microclimate modification, damage to soil, destruction of forest ecosystems, lowering of water tables, land erosion, water siltation, and massive flooding. Dams are thrown up helter-skelter for hydroelectric power and water impoundment on the great tropical rivers of the world, with dire implications for those freshwater elasmobranchs that need sea access or which cannot survive extreme conditions in reservoirs and stretches of rivers landlocked above dams.

Mining operations require water for refining, and dump water loaded with toxic heavy metals such as lead, copper and mercury into the rivers. Additionally uranium mining can add a variety of radioactive isotopes to the watershed. Heavy metals and radioactive isotopes are readily passed and concentrated along the food web in freshwater ecosystems, and if not immediately deleterious may later reach damaging concentrations especially in large aquatic predators such as elasmobranchs. Even illegal drug manufacturing contributes toxic organic chemicals to the watershed in South America.

Wars in Central and South America, the Middle East, and Southeast Asia have caused difficulties by increasing wanton exploitation of freshwater elasmobranchs and by creating massive pollution and other environmental damage through destruction of petrochemical complexes and other industrial sites, through extensive use of toxic herbicides to deny cover to guerrillas, and by blasting and mining the countryside with explosives.

Habitat degradation and exploitation can affect freshwater elasmobranchs directly, but also indirectly by affecting their prey. Freshwater sharks are broad-spectrum predators, but could be affected by overfishing or destruction of teleost populations. Freshwater stingrays feed on bottom invertebrates, which can be adversely affected by habitat modification and by pollutants.

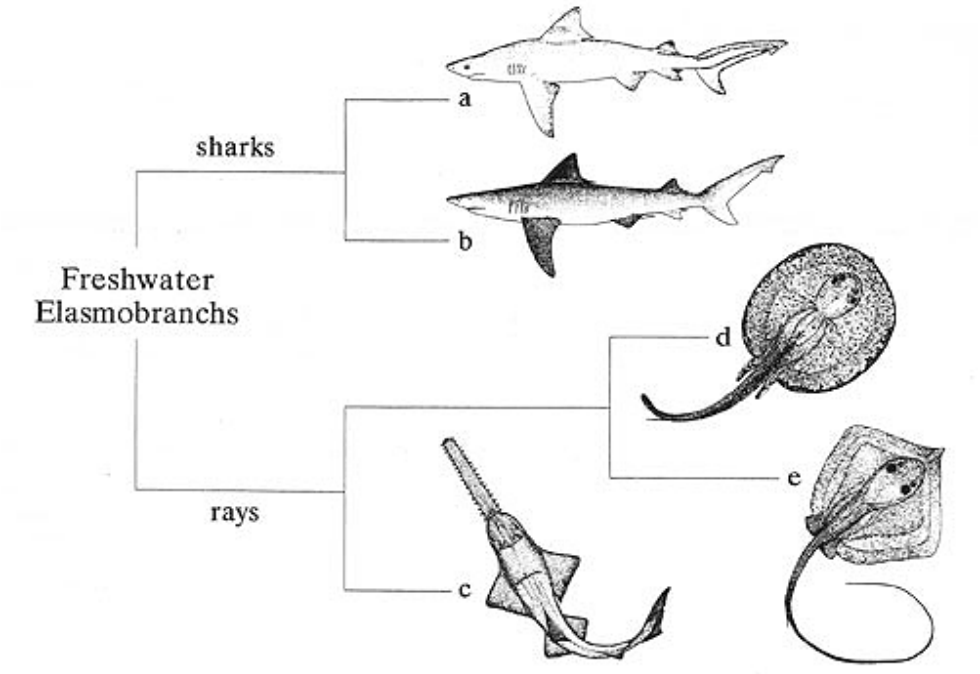

Figure 1. Representative examples from the four major elasmobranch families found in fresh waters.
Carcharhinidae: a) the euryhaline bull shark *Carcharhinus leucas* and b) possibly obligate freshwater Ganges shark *Glyphis gangeticus*.
Pristidae: c) euryhaline largetooth sawfish *Pristis perotetti*.
Potamotrygonidae: d) obligate freshwater South American stingray *Potamotrygon magdalenae*.
Dasyatidae: e) marginal or possibly euryhaline whiptail stingray *Dasyatis guttata*.

Shark graphics courtesy Compagno (1984). Batoid pen-and-inks by S.F. Cook. From L.J.V. Compagno & S.F. Cook. In press. The exploitation and conservation of freshwater elasmobranchs: status of taxa and prospects for the future. *Journal of Aquaculture and Aquatic Science*.

Economic and political issues

The problem of excessive exploitation and habitat degradation in environments inhabited by freshwater elasmobranchs is compounded by the widespread incidence of poverty and political instability in developing countries that contain them. There is little emphasis on management of aquatic resources, and often civil strife, regional or civil wars, hunger, disease, poverty, corruption, ineffective government, inadequate education, and many economic problems. Emphasis in such countries is on short-term fixes for problems, or on no fixes whatever, without regard to the ultimate destruction of ecosystems or the animals which inhabit them. In extreme cases the public mentality may be largely directed to human survival and little else.

World fisheries agencies, alarmed at stagnation of marine fisheries world-wide, suggest exploitation of new and under-utilised stocks and species to sustain human population growth rate. This bears ominous implications for freshwater elasmobranchs; it also fails to address the ultimate problem of human population growth and development, which tends to readily defeat such short-sighted half- measures.

Developing countries are increasingly subject to promotion of high-income tourist facilities for First World vacationers, which can introduce unrestricted sport angling for sharks and rays and anti- shark measures to remove elasmobranchs that may occasionally attack tourists. Such practices could be devastating to freshwater elasmobranchs in restricted bodies of water such as Lake Nicaragua or Jamoer Lake in New Guinea.

Vulnerable species

We expect obligate freshwater elasmobranchs with limited geographical distributions (such as many dasyatid and potamotrygonid stingrays and possibly the Ganges shark) or euryhaline species that are trapped by man-made barriers that prevent free transit to estuaries and the ocean to stand at greatest risk from human impact. Euryhaline elasmobranchs may be relatively less vulnerable than obligate freshwater species, but such species are generally confined to warm inshore marine environments that are exploited by low-technology, increasingly intensive artisanal and small-scale commercial fisheries as well as tourist sports fisheries, and coastal development/ degradation. Certain euryhaline species may need to reproduce in fresh water, and are affected by problems in freshwater breeding areas.

Priorities for research and management

Although the problems of high-technology, highly visible exploitation of marine sharks by offshore commercial fisheries have been increasingly addressed by conservationists in recent years, very little has been mentioned about the conservation and management of their more vulnerable freshwater counterparts. Small-scale, low-technology fisheries, and those in the tropics and in freshwater, receive far less attention than big oceanic fisheries, such as pelagic gillnetting and longlining. Elasmobranch conservationists are largely concentrated in more temperate countries in Europe, North America and Australia, and have given most of their attention to local exploitation and to high-seas fisheries. Sharks also get far more attention than rays or chimaeras. While much work has been done on selected aspects of freshwater elasmobranch biology, they still remain poorly known biologically, and important aspects of their biology including behavioural ecology and human impact (Including fisheries) on them urgently need to be investigated through dedicated, intensive field studies.

In view of the rapidly accelerating effects of human population growth and habitat destruction in the tropics, it is possible that several stocks and possibly whole species of freshwater elasmobranchs may become extinct in the next century. Particularly worrisome are some South American and Asian river stingrays, euryhaline sawfish, and the rare river sharks (genus *Glyphis*). Biological data is urgently needed for freshwater elasmobranchs to make it possible to attempt management and conservation. At present there is a vacuum of information, and elasmobranchs can easi ly drop to extinction without notice.

Development of a protocol for rational management and conservation of freshwater sharks and rays is critical, based in part on previous marine guidelines but taking into account the special and unique problems facing freshwater elasmobranchs.

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Update from the Galapagos

Sharks of the Galapagos Islands have received a reprieve from wide- scale, legal exploitation. Although a memorandum prohibiting shark fishing in the Galapagos Marine Resources Reserve was signed by Ecuador's President Sixto Duran-Ballen in September 1994, there remained concern that the fishery would open on January 15, 1995 because the memorandum was never formally signed into law. However, fishing effort has been temporarily diverted from sharks to a so-called "experimental" sea cucumber fishery.

For the moment, Galapagos fishers are not interested in legalising a shark fishery. Sea cucumbers are much more lucrative than shark fins and easier to collect. But sea cucumbers are going fast and it won't be long before the highly overcapitalised fishery shifts its effort to sharks and other species in demand by the Asian marketplace.

The get-rich-quick exploitation is encouraging immigration of fishers from the Ecuadorian mainland, and the expanding fishery is increasingly difficult to monitor and control. When the sea cucumber fishery was finally closed in December (after the catch had exceeded the quota by about 12 times), angry fishers seized the Charles Darwin Research Station and Galapagos National Park headquarters for three days in violent protest. If the Galapagos are to remain a priceless ecological jewel and a long-term source of income for Ecuador, conservationists urge that management of the Marine Reserve be based on sound science and ecological sustainability rather than the current drive toward resource "mining."

The SSG is still being asked to provide information on shark exploitation and management as requested in the Action Alert that accompanied the last issue of *Shark News*. A more detailed update and additional suggestions for action are available from the author, Merry Camhi (by mail or e:mail: mcamhi@audubon.org), who recently returned from a meeting with conservationists and Ecuadorian officials in the Galapagos Islands as a representative of the SSG.

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ICES takes action on elasmobranchs

The International Council for the Exploration of the Sea (ICES) has noted a more than 25% drop in elasmobranch landings between the early 1960s and the mid 1980s (with the exception of spurdogs, which are generally sustaining yields, despite fluctuations). Levels of by-catch of non-targeted species discarded and their mortality rates are unknown, under-utilisation of elasmobranchs (i.e. finning and liver extraction) has resulted in misleading or non-existent landing statistics, andmany species are not properly identified in the statistics.

The ICES Demersal Fish Committee therefore recommended, in September 1994, that a Study Group on Elasmobranch Fishes should be established. It will meet from 15-18 August 1995 to:

a) review the status of elasmobranch stocks within the Northeast and Northwest Atlantic and, where possible, identify trends in biomass and recruitment; b) identify the extent of the commercial and sport fisheries in which elasmobranchs are targeted or are caught as by- catch and to estimate the amount (biomass/numbers per size class) of elasmobranchs taken as catches and lost as discards; c) describe/ review the ecological role of elasmobranch species, their reproductive dynamics and predation of elasmobranchs taken as catches and lost as discards; d) co-ordinate techniques of age determination and age verification of elasmobranchs; e) co-ordinate methods on modelling and assessment of elasmobranch stocks; f) identify the development of compensatory mechanisms as a response to exploitation; g) outline an action plan for attaining the goals set above; h) report to the Demersal Fish Committee in 1995.

Findings from a, b and c above will be made available to the ICES Working Group on Ecosystem Effects of Fishing Activities.

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Overview of world elasmobranch fisheries

Ramon Bonfil. 1994. FAO Fisheries Technical Paper No. 341. FAO, Rome. 119pp. ISBN 92-5-103566-0.

This report is an extremely valuable source of information on the major world elasmobranch fisheries: their importance, recent trends, problems for assessment and management, conservation and the prospect for their sustainability. Patterns of exploitation in FAO statistical areas are considered through an index of relative production, as well as trends and outlooks. Accounts of fisheries by the major elasmobranch fishing nations and the high-seas fisheries with significant elasmobranch by- catches are provided. Estimates for by-catch in former high seas driftnet fisheries are 3.28 to 4.31 million sharks and rays *per annum*, (1989-91) and longline fisheries 8.3 million per annum: a total of about 300,000 tonnes. The world elasmobranch catch was 704,000 tonnes in 1991; if present trends continue it could reach 755,000 to 827,000 tonnes by the year 2000. However, the total annual catch inclusive of discards and unreported catches is estimated at around 1.35 million tonnes.

According to reported catches from the last 15 years, sharks account for almost 60% of the world elasmobranch catch, and skates and rays for almost 40%. Major fisheries (annual catches of sharks and rays >10,000t) occur in 26 countries. Information on species, gear, patterns of exploitation, research and management of elasmobranchs is summarized for each of these countries. Elasmobranchs are especially important for the fisheries of Sri Lanka, Pakistan and Australia. However, of these 26 nations, only three countries have specific management programmes for shark and ray fisheries. The general problems in appraising and managing elasmobranch fisheries sustainably and the need for conservation are discussed, and possible solutions for some of these problems proposed.

Cetaceans. An Action Plan for the Conservation of Whales, Dolphins and Porpoises, 1994-1994

Compiled by Randall R. Reeves and Stephen Leatherwood. 1994. ISBN 2-8317-0189-9.

The IUCN has recently published the 1994-1998 Action Plan for the Conservation of Cetaceans, an updated version of the 1988 Action Plan. The publication outlines 51 projects aimed at species that are already endangered or not presently otherwise protected. It also covers the major threats to species and populations and discusses technical and socio-economic changes necessary for species survival.

The order Cetacea has at least 79 representatives in all oceans and some major river systems. Over-fishing of the great whales, the ongoing exploitation of the dolphins and

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porpoises and their capture as a commercial fishery by-catch has depleted their populations. The many similarities between the conservation issues faced by cetaceans and sharks and rays make this a particularly useful reference document.

Copies are available from the following addresses:

IUCN Publications Services Unit, 219c Huntingdon Road, Cambridge CB3 ODL, UK. (fax. +441223 277894). £15.53 including postage and packing in UK, £16.20 overseas surface mail, £17.55 airmail to Europe or £18.90 airmail rest of world. Payment by cheque/ international money order made payable to IUCN, or American Express/Visa.

Island Press, Box 7, Covelo, California 95428, USA. (fax +(1) 707 983 6414) for US and Canadian customers only. US shipments are US$20.00 plus US$4.75 postage for the first book and US$1 extra for each additional book. Californian residents please add 7.25% tax, and Washington DC residents please add 5.75% tax. For Canadian shipments include US$5 for the first and US$3 for each additional book for International Book Rate or UK$10 & US$3 for UPS shipment.

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World Wildlife Fund

The booming shark trade, which may claim as many as 100 million sharks each year, has at last attracted international scrutiny.

When the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) met in Fort Lauderdale, Florida, last November it decided for the first time to review this huge but little-known trade.

CITES Parties agreed to help the CITES Animals Committee gather information on shark trade and biological status before the next CITES meeting in 1997. TRAFFIC, the international wildlife trade monitoring programme of WWF and IUCN has started a major investigation into the global shark trade which will contribute to this review.

"The results of our investigation will help assess the impact of the international shark trade and determine necessary controls and conservation measures," said Jorgen Thomsen, Director of TRAFFIC International.

WWF lobbied for CITES intervention, reflecting the fact that sharks are not covered by international fisheries agreements. Trade however is brisk, thanks largely to rising prices for shark fins from the burgeoning Asian food market. Other markets exist for shark cartilage, meat, liveroil and skin. Significant numbers of sharks are also killed as a by-catch of other fisheries.

At present there is virtually no monitoring or regulation of global shark fisheries and their impact on populations is unclear. However, from the relatively little that is known about shark biology, exploited species appear poorly-equipped to adapt to current fishing techniques.

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WWF UK is funing this issue of *Shark News* because we believe that this newsletter provides an excellent medium for information exchange on shark issues. We consider this important for raising awareness of these special species and their conservation.

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Meetings

Any information on forthcoming meetings and notes/comments on relevant meetings attended by readers would be most gratefully received by the editor. Please send them in for the next issue!

FAO Committee on Fisheries biennial meeting
Rome, Italy. 20-24 March 1995.
Reviewed draft text of the Code of Conduct for Responsible Fisheries will be submitted to the meeting. The Code has six thematic areas: Fishery management practices, Fishing operations, Aquaculture development, Integration of fisheries into coastal area management, Fair trade practices (including post-harvest practices), and Fisheries research.

Eleventh Annual Meeting of the American Elasmobranch Society
University of Alberta, Edmonton, Canada. 15-19 June 1995
This will take place during the 75th Annual Meeting of the American Society of Ichthyologists and Herpetologists. Contact the organisers by e-mail: ASIH95@biology.ualberta.ca. or regular mail:ASIH95 Local Committee, Department of Biological Sciences, University of Alberta, Edmonton, Alberta T6G 2E9, Canada.

UN Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks
Second and third meetings: New York City, USA.
27 March-12 April and 17-28 July 1995.

ICES Study Group on Elasmobranch Fishes
First meeting: International Council for the Exploration of the Sea headquarters. 15-18 August 1995. Chairman Dr Holder da Silva.
Review of elasmobranch stocks, fisheries, ecology and research (see page 6 for more details).

IUCN World Conservation Congress
Montreal Conference Centre, Canada. 14-23 October 1996.
Details from IUCN, 28 rue Mauverney, 1196 Gland, Switzerland.

European Elasmobranch Society (EES) meetings
London, UK. December 1994 and February 1995.
A steering group working towards setting up a European Elasmobranch Society has met twice. For more information contact Jim Ellis, University College Swansea, Marine Biology, Singleton Park, Swansea SA2 8PP, UK. Email internet:bdellis@swansea.ac.uk

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