

## The IUCN/SSC Shark Specialist Group



*Shark News 2: October 1994*

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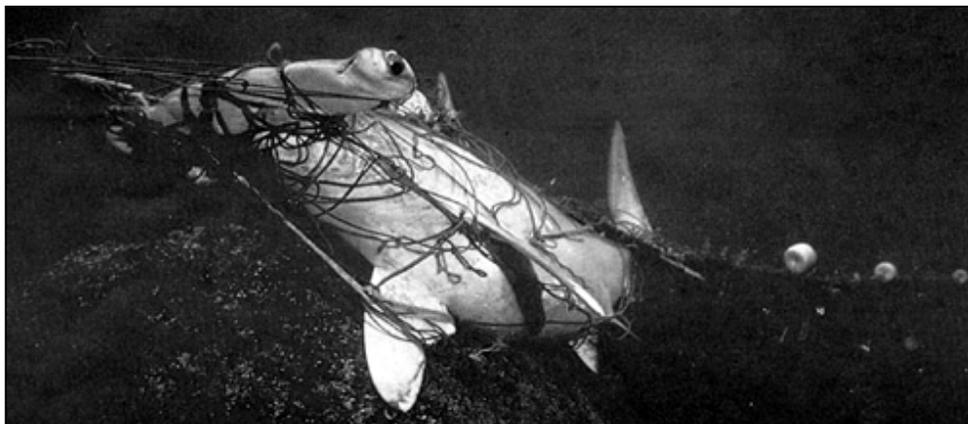


### Sharks in Galapagos in peril

*Merry Camhi, National Audubon Society*  
*Sid F. Cook, Argus-Mariner Consulting Scientists*

While shark populations around the world have been seriously over-fished for some years, one of the newest threats is even more alarming because it is taking place within the protected waters of the Galapagos Marine Resources Reserve. On 23 June 1994, Ecuador reversed a long-standing provision that protected the sharks of the Archipelago from intensive commercial exploitation. From 16 January to 15 April 1995, permitted fishers will be allowed to legally fish for sharks in Reserve waters beyond 3 miles from shore. Sea cucumbers, lobsters and groupers will also be fished commercially. Because the Galapagos Islands have long been an international model for the protection of biodiversity, the implications of this move are of great concern to the scientific and conservation communities.

Twenty seven species of chondrichthyans in nine families are documented from the nearshore waters of the Archipelago (Lavenberg *et al.* 1994; Grove & Lavenberg, in press). The islands are one of the last places in the world to see large numbers of hammerheads, including great (*Sphyrna mokarran*), smooth (*S. zygaena*), and schools of scalloped hammerheads (*S. lewini*). Together with 11 species of requiem sharks (F. Carcharhinidae) these two groups are the most heavily exploited of the sharks in Galapagos because their fins are highly prized in the fin markets of the orient. The remaining 13 species of sharks found around the Archipelago and three other species that may casually visit the area are not targets of a commercial fishery at this time (Lavenberg *et al.* 1994). However, they may be caught incidentally in gear set for the target species.



Scalloped hammerhead sharks *Sphyrna lewini* caught in shark net illegally set in Galapagos

Marine Reserve, Wolf (Wenman) Island, Galapagos. © Doug Perrine.

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### **Protection for the marine environment**

The Galapagos are recognized as a hotbed of biological diversity and the birthplace of evolutionary science. They have been a focus of global conservation efforts for decades. Establishment of the Galapagos National Park in 1959, declaration as a World Heritage Site in 1971, and as a Man and the Biosphere Reserve in 1982 provided extensive protection to terrestrial flora and fauna and advertised Ecuador's commitment to the preservation of these ecological treasures. In turn, these conservation actions have served Ecuador well by encouraging a thriving and lucrative eco-tourism industry.

Protection for the marine environment, however, did not come until 1986, when the Galapagos Marine Resources Reserve was established. Covering 70,000 km<sup>2</sup>, including the interior sea of the Archipelago and out to 23 km, the GMMR is second in size only to the Great Barrier Reef Marine Park. In addition, since 1990, all inland waters have been declared an International Whale Sanctuary. Other legislation prohibits the capture and trade of any sea turtle species within Ecuadorian waters.

Although rapid growth in marine tourism and marine pollution are taking their toll, the Charles Darwin Foundation identifies large- scale commercial fishing as the single greatest threat to the marine environment of Galapagos. Through their diligent work, in co- operation with technical experts from around the world, a marine management plan was developed and signed into law in August 1992. The management plan allows for local, traditional, and artisanal level commercial fishing in the Reserve, but severely curtails industrial- level fishing. Yet there has been continual pressure by national and foreign fishing interests to legalize major commercial fisheries in Galapagos for sharks, sea cucumbers, lobsters, and groupers.

### **History of illegal exploitation**

Despite Reserve designation, illegal, industrial-scale fishing in Galapagos has been rampant over the past 5 years. Clandestine shark fisheries were discovered in 1988 and 1991: tens of thousands of sharks were killed for the Asian fin market, at times using the strictly protected local sea lion as bait. Local protest prompted legislation that prohibited shark fishing within most of the Reserve, as well as the transport and trade of fins to the mainland of Ecuador. Over the past two years, despite the ban, dive tour operators have observed at least 100 dead hammerhead and Galapagos (*Carcharhinus galapagensis*) sharks, as well as sea turtles, tangled in fishing nets. There are anecdotal reports that the once common Galapagos and silky sharks (*C. falciformis*) have declined markedly.

In 1992, an extensive illicit fishery also developed to export protected sea cucumbers to Asia. Lobster have been subject to a seven-year fishing moratorium to prevent their extermination and grouper are also being depleted. Up to 80 major fishing vessels from Japan, Taiwan, and Korean licensed to fish for tuna are illegally long- lining for sharks and sea turtles and trading in other protected species within the Reserve. Effective marine patrolling and enforcement of the management plan are constrained by a lack of patrol vessels and expertise in marine resource protection.

Fuelled by these foreign fishing interests and by the indecisiveness of the Ecuadorian government over whether or not to lift previous fishing bans in the Reserve, fishers mounted a protest and picketed the Charles Darwin Research Station in June 1994. They threatened to kill rare giant tortoises (indeed, over 80 tortoise deaths have been confirmed on Isabela Island in 1994 alone) and to introduce non- native species to the few remaining pristine islands, if the bans were not lifted.

### **Ecuador capitulates**

Yielding to this pressure, on 23 June 1994, the Ecuadorian government lifted previous bans on the large-scale commercial fishing for sharks, sea cucumbers, lobsters, and groupers. The new fishery regimes undermine the integrity of the approved and biologically defensible management plan for the Marine Reserve. According to Alfredo Carrasco, Secretary General of the Charles Darwin Foundation, "If adopted, this plan

will allow for the piecemeal management of the Reserve, ignoring the carefully established zoning scheme and exploiting precisely those areas that are the most pristine and fragile." Apparently, no catch quotas or management plan has been developed for the new shark fishery.

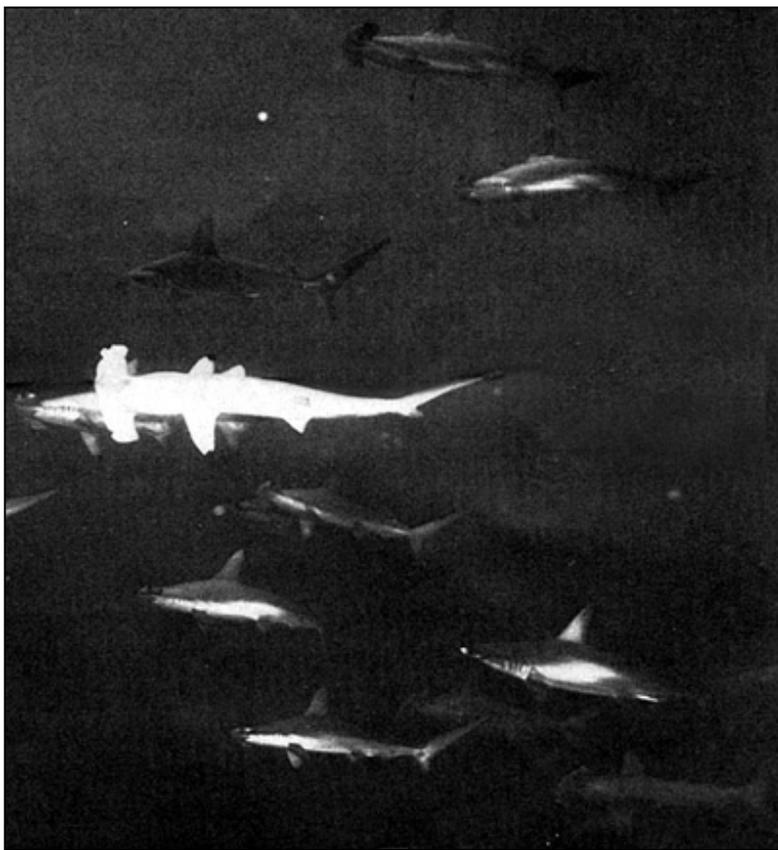
### **Long-term impact of the fisheries**

Targeted sharks, sea cucumbers, and lobsters are not the only species at risk from the intensified fishing activities. As apex predators, the larger shark species may play an important but still poorly understood role in structuring the marine community in Galapagos. These large sharks (likely targets of the new fishery) prey on sea lions, fur seals, smaller shark species, and/or juveniles of the large shark species. In other locales, such as off southeastern Africa, where large sharks were heavily fished, the resulting proliferation of the smaller sharks led to a decline in bony fishes important to local sport and commercial fisheries.

Similarly, there is concern that the excessive exploitation of sea cucumbers will reverberate up through other links in the marine food chain because their larvae are a major component of the local zooplankton. Even the terrestrial environment is being damaged by these fisheries as mangrove is being heavily cut for boiling sea cucumbers prior to export. Birds, such as the endemic Galapagos penguin and flightless cormorant, who depend on the sea for their food, could be adversely affected as well.

Sustainable exploitation of sharks and sea cucumbers have been unattainable everywhere in the world. Failures of specific fisheries have been well documented including the North Atlantic porbeagle (*Lamna nasus*) fishery in the 1960s and the bull shark (*C. leucas*) of Lake Nicaragua in the 1970s (Thorson 1985). Cook & Compagno (in process ms) have estimated that more than 90% of the directed shark fisheries in the 20th Century have failed and detail the factors causing fishery failure.

The pattern of sea cucumber exploitation has been to "mine out" one area and then simply move on to the next. Heavily fished areas in Micronesia prior to World War II, still have not recovered. In 1994, the Darwin Foundation requested that IUCN conduct an assessment of sea cucumber status in Galapagos. The study concluded that sea cucumber have already been wiped out in a number of locations and that the ban on sea cucumber fishing in the Reserve should be maintained. Because of this and other severe management problems with illegal fishing, the Galapagos Marine Resources Reserve was denied World Heritage Site status, to send a message to Ecuador to better protect these unique resources.



Schooling scalloped hammerheads *Sphyrna lewini*.  
Photo: Jeremy Stafford-Deitsch

### **Conclusion**

The short-term exploitation of Galapagos marine resources will directly benefit less than 2% of the islands' residents. It is unclear how much it will generate compared to Ecuador's US \$50-60 million annual tourism industry. As has been demonstrated in Costa Rica's Cocos Island and Mexico's Sea of Cortez, overfishing of hammerheads there precipitated the loss of a booming dive trade (Robertson 1994). In the Maldives, it is estimated that a grey reef shark may be worth one hundred times more alive at a dive site than dead on a fishing boat (Anderson & Ahmed 1993).

Because so little scientific data is presently available, it is difficult to determine what, if any, sustainable level of fishing may be possible in the Marine Reserve. To confound the problem, even if defensible quotas could be established, monitoring of catch levels and enforcement of fishing restrictions would be nearly impossible given the financial constraints of fishery management agencies and the lack of patrol vessels in Galapagos. Because these populations are so susceptible to over-exploitation, and because effective management is unlikely, we are strongly urging Ecuador not to open large-scale fisheries for sharks, sea cucumbers, and lobsters in the Galapagos Marine Resources Reserve.

*Our thanks to the Charles Darwin Foundation, Jack Stein Grove, Doug Perrine, Daniel Cerzon, and Sonny Gruber for providing information for this article.*

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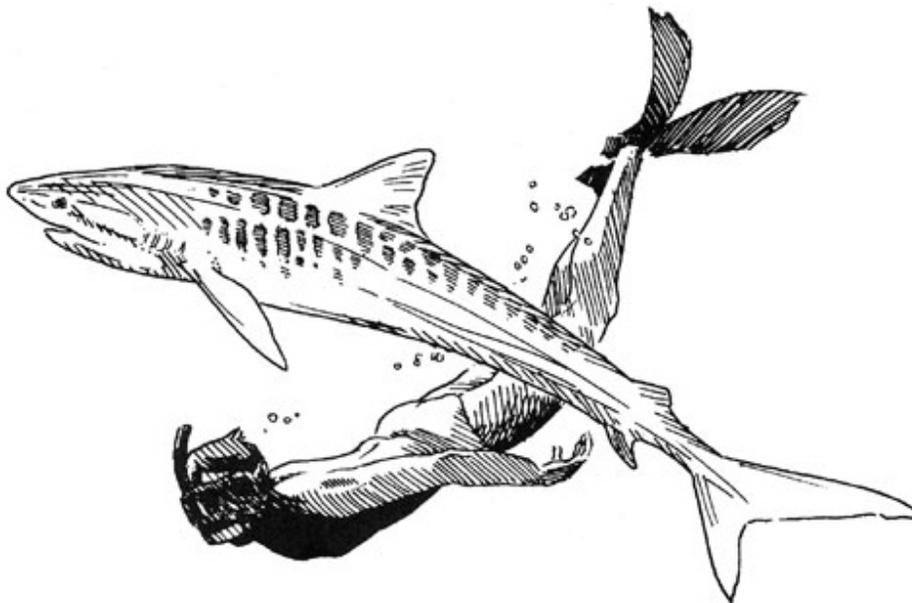


### Some of my best friends are sharks!

#### *Bernard Seret reports on a fabulous adventure in Bimini*

In April 1994, a group of twelve young people from France, aged from 14 to 17 years, lived through one of the most exciting experiences of their lives in Bimini (Bahamas): they now have new friends! However, these friends are not ordinary ones. They usually have a bad reputation and people do not like them because of their 'ugly mugs'! Still, they are wonderful "buddies" when one makes an effort to get to know them.

Our young peoples' new friends have curious names: *Galeocerdo cuvier*, *Ginglymostoma cirratum*, *Negaprion brevirostris*, *Carcharhinus perezi*, etc. These esoteric labels are those of fearsome creatures, sharks! They fascinate us, but we are also afraid of them - mainly because we are frightened of what we do not know and understand. However, the sojourn in the Bimini Shark Laboratory (the Biological Field Station run by Professor Samuel Gruber) allowed our young people to learn a lot about sharks and also to like and respect them.



The initiation started months ago in Paris with Bernard Seret (Elasmobranch Scientist in ORSTOM) with a series of lectures and personal homework. Then, at last came the first encounter in Bimini waters. What an opportunity! The first shark was not only one of the most feared, a tiger shark, but the encounter also took place by night. Hardly surprisingly, there was some hesitation among our young people when they had to jump into the sea - what an ambiguous feeling is produced by conflicting fear and eagerness to communicate with a mythical creature! The first contacts were very

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hesitant, but step by step the kids started to pat the rough skin of the shark, its tail, its body then finally coming close to the head and famous jaws. following this first experience, other encounters took place. Then we had to restrain the excitement of our teenagers who wanted to swim with the sharks and play with them. Well, the aim of this adventure was not to play, but to discover these living myths and to put an end to the sad and unrealistic 'jaws' image which has been given to sharks for so long. This ocean planet is becoming more and more widely colonised and exploited by humans, but it is possible to share the oceans with their inhabitants, even with the most feared of them, the sharks.

This message was clearly received by the young Frenchies. There is no doubt that Stephanie, Martin, Mathieu, Momo and the others are now willing to share their own experience to make sharks better known (a TV video is available and a special report is in preparation). As a result all of them can assert that 'some of their best friends are sharks'. Indeed, this kind of educational programme is in keeping with the aims of the IUCN Shark Specialist Group.

### **Acknowledgements**

This adventure was made possible thanks to the collaboration between the Ushuaia Foundation, the City Hall of Paris, the French Research Institute ORSTOM and the diving school 'Blue Dive'. Special thanks are due to the whole staff of the Bimini Shark Laboratory: 'Doc' (Professor Samuel Gruber), Dr Enric Cortes, Ms M. Gruber ('Shark Mum') and Aia.

Bernard Seret, Antenne ORSTOM, Museum national d'Histoire naturelle, Laboratoire d'Ichtyologie, 43 Rue Cuvier, 75231 Paris cedex 05, France.

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### Disputed cancer 'cure' spells disaster for Costa Rica's sharks

*Johel Jimenez, Tropical Conservation News Bureau*

In a small factory in the Pacific port town of Puntarenas, Costa Rica, workers process towering mounds of cartilage taken from one of the county's many diminishing wildlife species: sharks. Business is thriving, even if the shark population is not. According to Luis Mena, manager of Shark Technology of Costa Rica, from April-December 1993, monthly production of dried and crushed cartilage increased from about 3,000 to 22,500 pounds.

Ninety percent of the cartilage is shipped to the United States, where it is turned into pills that are sold in the U.S. and in Germany, England, and other European markets. Not approved by the U.S. Food and Drug Administration, the pills are sold in health magazines. One brand of shark cartilage pill, called Requin 3, sells for \$59 for 90 capsules.

Why would anyone pay so much for crushed cartilage? According to biochemist Dr. William Lane, who in 1990 helped establish Shark Technology, shark cartilage contains protein that inhibits tumor growth. His conclusion is based on his own research. He has published no scientific papers, offering only anecdotal evidence. "Shark cartilage is a unique and extremely promising treatment for cancer," Lane told the Journal of the National Cancer Institute.

Mena is enthusiastic about Lane's claims. "Before, I did not dare say that sharks cured cancer," he said. "Today I believe it, after seeing Dr. Lane's research with 30 patients with terminal cancer in Cuba. Ninety percent of them were cured, to the surprise of prominent Cuban doctors."

The chief of oncology at Costa Rica's National Children's Hospital is not convinced. "These claims have no scientific validity," said Dr. Francisco Lobo Sanahuja. A spokeswoman for the National Cancer Institute agrees. "We consider [shark cartilage pills] pretty much a farce," she said, adding that her advice to cancer patients is "not to waste their money."

Sharks almost never get cancer. Biochemist Carl Luer at the Mote Marine Laboratory in Sarasota, Florida, has tried in vain to induce a tumor in sharks. Researcher Trish Blum works with Luer's research team and is trying to isolate the cancer-inhibiting protein so it can be produced synthetically. But Blum emphasizes that "there is presently no evidence to support the idea that taking pills made of shark cartilage would have any effect on cancer."

As in many other countries, including the United States, Nigeria, Nicaragua, Mexico and South Africa, the shark population in Costa Rica is collapsing from overfishing. Also threatening the sharks is the market for shark fins, which are exported to Asian

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countries for shark- fin soup. In Costa Rica, shark fins are sold for as much as \$65 a pound.

Sharks may not be able to withstand this deadly pressure much longer. Most shark species do not begin breeding until they are 10 or 12 years old. Many species produce just two offspring per breeding cycle. Odds are, then, that a dismal percentage of the sharks hauled into Shark Technology have not reproduced. Ecologists worry that the disappearance of sharks, which are at the top of the food chain, could have a devastating effect of the complex web of life in the ocean.

But if a Costa Rican enterprise is contributing both to medical fraud and ecological disaster, the country seems unconcerned. President Rafael Calderon presided over Shark Technology's inauguration. In 1992, Costa Rica's Export council awarded the factory its prize as the most original new export business.

Nor is Mena worried about depletion of the species on which the business depends. "When there is scarcity, we will import cartilage from Guatemala or El Salvador," he said. He explained that to produce their old quota of 7,000 kilos of dried cartilage each month, they need 350,000 kilos of "green" cartilage. And they'll take any kind of shark they can get. When asked how many sharks per day the factory processed, the manager refused to answer. When pressed if it was 100 a day, 200 a day? The manager just said, "More than that."

The company plans to open another factory, in a small port town on Nicaragua's Caribbean coast.

*The above story first appeared in Living Oceans News, Spring/Summer 1994, a newsletter of the National Audubon Society's Living Oceans Program, and is reproduced with the Society's permission.*

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### Regional news

#### Shark finning in the Red Sea

During the summer of 1994, Yemeni fishing boats have been travelling north into Sudanese and Egyptian waters catching and finning sharks. Sha'ab Rumi reef, that normally hosts 30 or 40 grey reef sharks (and other species) on its southern point has been cleaned out of sharks. The fishermen were arrested by the Sudanese authorities after the damage was done. Other Yemeni shark-fishing boats have been spotted on Elba Reef on the Egyptian/Sudanese border, with shark fins drying on their decks.

To my knowledge, finning is a new development in the region. The diving industry of Egypt has a turn-over of many millions of dollars annually and divers travel to these waters to see sharks. The Sudan could support an equivalent tourist industry if it so desires, provided that the shark populations of its reefs remain. On the other hand, the fins of a dead shark are worth only a handful of dollars.

Jeremy Stafford-Deitsch

#### Canada

The Department of Fisheries and Oceans, Ottawa, banned the finning of sharks (removal and retention of fins and discard of the carcass) on June 6, 1994. The Department has also produced a draft shark conservation and management plan for controlling and monitoring fisheries for mako, porbeagle and blue shark. The preparation of this Plan followed extensive industry consultations, and it should be completed and approved by the end of the year.

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### Sharks and cancer the real story

**Carl A. Luer, Manager, Biomedical Program, Mote Marine laboratory**

Sharks and their relatives, the skates and rays, have enjoyed tremendous success during their nearly 400 million years of existence on earth. One reason for this certainly is their uncanny ability to resist disease. Sharks do get sick, but their incidence of disease is much lower than among the other fishes. The low incidence of tumors found among the sharks and their relatives has prompted biochemists and immunologists at Mote Marine Laboratory (MML) to explore the mechanisms that may explain the unusual disease resistance of these animals. We designed experiments to see whether tumors could be induced in the sharks and skates by exposing them to potent carcinogenic (cancer-causing) chemicals. While there were similarities and differences in the responses when compared with mammals, no changes in the target tissues or their genetic material ever resulted in cancerous tumor formation in the sharks or skates.

These chemical exposure studies, encompassing about ten years of research effort, have led us to more recent investigations of the shark immune system. Compared to the mammalian system which is quite specialised, the shark immune system appears primitive but remarkably effective. Sharks apparently possess immune cells with the same functions as those of mammals, but the shark cells appear to be produced and stimulated differently. Furthermore, in contrast to the variety of immunoglobulins produced in the mammalian immune system, sharks have only one class of immunoglobulin (termed IgM). This normally circulates in shark blood at very high levels and appears to be ready to attack invading substances at all times.

Another difference lies in the fact that sharks, skates, and ray lack a bony skeleton, and so do not have bone marrow, where the immune cells in mammals are produced. In sharks, the immune cells are produced in the spleen, thymus, and unique tissues associated with the gonads and oesophagus. Our studies at MML in collaboration with researchers at Clemson University have determined that a significant number of immune cells, which mature and circulate in the shark's blood, may be available to respond without a lag period resulting in a more efficient immune response.

Our future plans include further investigations of the differences between mammals and sharks in the regulation of immune cells. This information may someday lead to improved methods of immune cell regulation in humans, especially cancer patients.

But human health applications from our research are many years in the future, and will rely on continued funding and active collaboration with the drug industry and medical community. Meanwhile, there are many public misconceptions about the clinical potential of shark-derived products for treatment of disease. For example, freeze-dried shark cartilage pills, marketed as food supplements through health food stores and mail order houses, are being touted as miracle cures for cancer as well as arthritis.

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The claims are based on research conducted during the 1980s at the Massachusetts Institute of Technology (MIT) and at Mote Marine Laboratory. These studies of cow and shark cartilage were designed to understand how cartilage is naturally able to resist penetration by blood capillaries. If the basis for this inhibition could be identified, it was reasoned, then it might lead to the development of a new drug therapy. Such a drug could control the spread of blood vessels feeding a cancerous tumor, or the inflammation associated with arthritis.

The research showed that only very small amounts of active material, with limited ability to control blood vessel growth, can be obtained from large amounts of raw cartilage. The cartilage must be subjected to several weeks of harsh chemical procedures to extract and concentrate the active ingredients. Once this is done, the resulting material is able to inhibit blood vessel growth in laboratory tests on animal models, when the concentrated extract is directly applied near the growing blood vessels.

Unfortunately, there is no logical reason to conclude that freeze-dried shark cartilage pills taken orally could "seek out" a malignant tumor in a cancer patient and inhibit the blood vessels feeding it in a manner similar to the laboratory tests. Also, there is no reason to think that shark cartilage contains anything which is not found in other animal cartilage. Sharks are used because their entire skeleton is cartilaginous.

Finally, since in laboratory tests it must be chemically extracted, there is no reason to assume that the active material in the cartilage is passively released to inhibit blood vessel growth elsewhere in the body. This means that cartilage, no matter whether in a shark, a cow, a dog, or a human, probably plays no active role in disease resistance in the living animal. The statements made by shark cartilage pill promoters that it is cartilage that give sharks their immunity to cancer, then, are inaccurate and irresponsible.

This is not to say that the basic research to understand the chemical basis for cartilage resistance to blood vessels shouldn't continue. The potential for this research to lead to new drug therapies is very real. But what should be halted is the use of sharks as a source of cartilage to be ground up and marketed as a panacea, with little or no support for effective results in fighting disease when taken as a food supplement.

*The above story was excerpted with permission from an article that first appeared in Mote Marine Labs' Shark Line, Summer 1993.*

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### Shark organisations worldwide

#### Mote Marine Laboratory, Center for Shark Research

Mote Marine Laboratory, an independent, non-profit marine research and education center in Sarasota, Florida, was named by the US congress as the site for the Center for Shark Research (CSR) beginning in April 1992. This designation has made Mote an international site for the scientific study of sharks in cooperation with the National Marine Fisheries Service (NMFS). The Center is charged with three primary responsibilities. It leads new interdisciplinary research efforts on sharks, hosts international conferences to address both fisheries and basic biology issues, and enhances public awareness of sharks as an important component of marine ecosystems.

To achieve this last responsibility, the Center publishes *The Shark Line* newsletter twice a year - Summer and Winter. *The Shark Line* contains articles pertaining to the shark research done at Mote and elsewhere, current happenings in the research field, and educational activities for teachers and students.

If you'd like to receive *The Shark Line*, please write or call: Heather Henry, Public Relations, Center for Shark Research, Mote Marine Laboratory, 1600 Ken Thompson Parkway, Sarasota, FL 34236 USA. Phone (+1) 813-388-4441. Fax (+1) 813-388-4312.

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### East Asian fin trade

*North-west Pacific subgroup of the IUCN Shark Specialist Group*

This article is extracted from *The status of elasmobranch fisheries in the western North Pacific*. Report of the North-west Pacific subgroup of the IUCN Shark Specialist Group, Regional Vice Chair Sho Tanaka.

The full report presents the status of the landing and fisheries of elasmobranchs in east Asian countries, based on FAO Fishery Statistics, reviews trends in landings over the past ten years, and identifies fisheries research needed.

#### Catches of elasmobranchs by east Asian countries

The (landed) catch of chondrichthyan fishes in the world's oceans has shown an increase since 1983 and exceeded 700,000 metric tonnes (t) in 1990. East Asian countries landed about 200,000 t from 1981 to 1988. Their catches then increased and reached 270,000 t in 1990, representing one third of the recorded world landings. FAO areas 61 and 71 border east Asian countries. Catches in the former area showed a reduction in 1988, but have remained stable at about 100,000 t. On the other hand, the catches in area 71 increased gradually after 1983 and lately came level with those in the former area.

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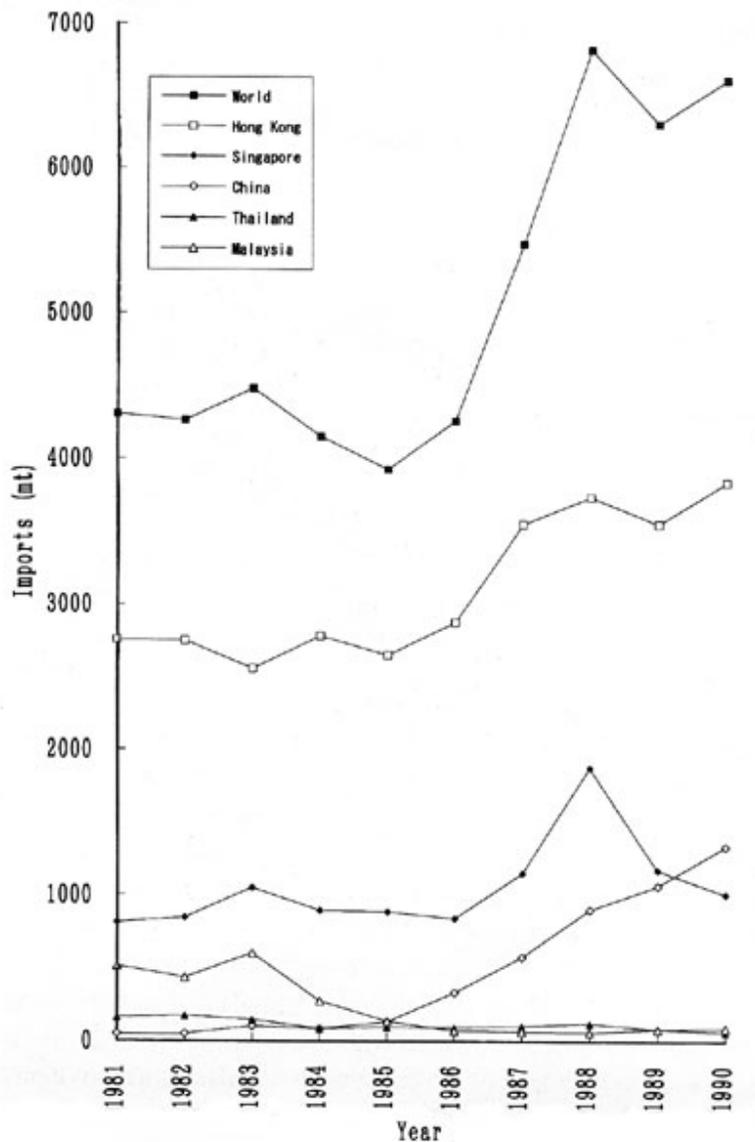


Figure 1. Exports of shark fins in the world and east Asian countries.

The recorded catches in FAO area 61 are attributable to Hong Kong, Japan, South Korea and probably Taiwan, but the catches in this area by China, North Korea, Russia and Viet Nam are not described in FAO Fishery Statistics. Indonesia, Japan, Malaysia, Philippines, Singapore, south Korea and Thailand record their catches in FAO area 71. Oceanian countries also make a catch of chondrichthyan fishes in FAO area 71. The full Shark Specialist Group report from which this article is extracted reviews and explains the recorded catches of elasmobranch fishes in each country by FAO area.

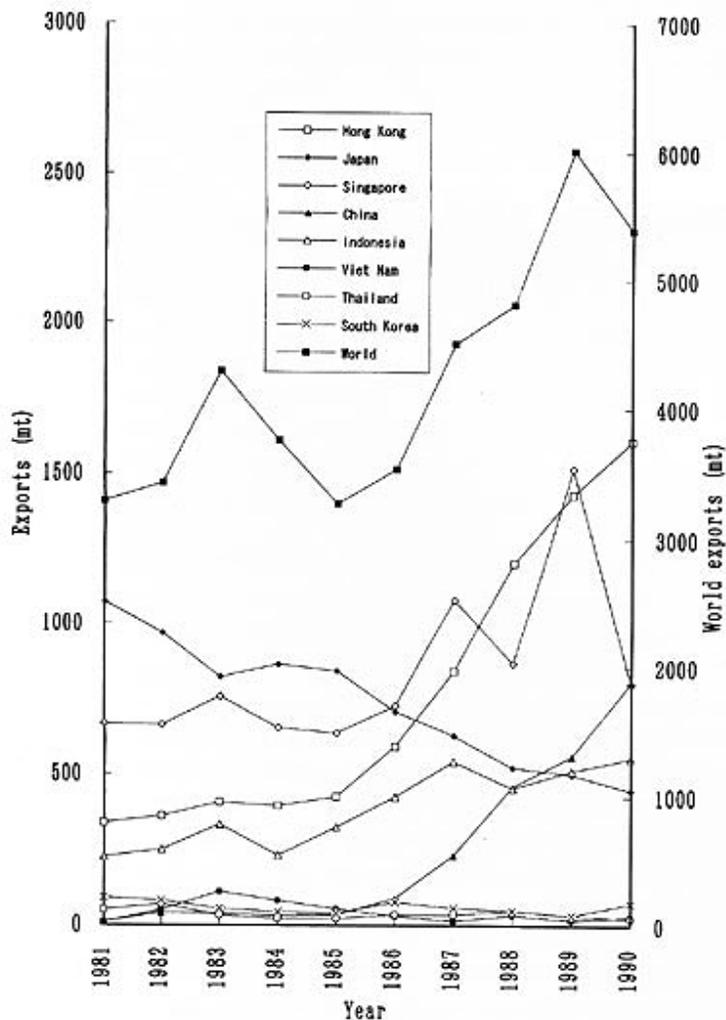


Figure 2. Imports of shark fins in the world and east Asian countries.

### Shark fin trade

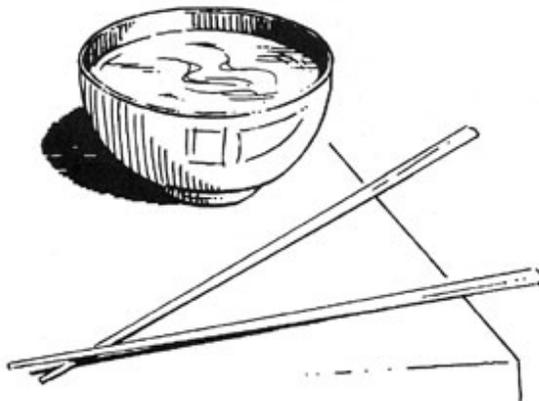
In south-eastern Asia, shark fin is an important ingredient of Chinese soup. The first dorsal fin and lower lobe of the caudal fin are more valuable than the second dorsal and pectoral fins. The value of fins also varies with species. When a shark is caught the fins are cut off and usually dried naturally, and the body is frozen as a semi-dressed fish or fillet, or discarded. In Japan, fin landings are not recorded and fins are traded directly between fishermen and fin merchants. The wet weight of the first dorsal, caudal and pectoral fins is 4%-7% of body weight.

Landings of shark fins are not published for east Asian countries, but export and import data for shark fins in each country are available from FAO. As shown in Figure 1, world exports varied from 3,200 to 4,300 t until 1986, then increased sharply to 5,400 t in 1990. Exports from east Asian countries have represented 72%-80% of the world total since 1985, Hong Kong and China show a strong increase in exports from 1985, and those from Singapore are subject to sharp fluctuations. The exports from Japan, however, continue to decrease and have halved over ten years. South Korea, Thailand and Vietnam all export less than 100 t of shark fins.



Similarly, world imports of shark fins were stable at about 4,200 t until 1986 (Figure 2). They then increased rapidly to a level of about 6,600 t. Imports to east Asian countries commonly comprise over 95% of the world total, and Hong Kong handles more than half of all recorded world imports. Singapore's imports have been steady between 800 and 1,000 t, except in 1988. China shows a gradual increase from 1986 and imported more than Singapore in 1990, Imports to Malaysia and Thailand have been about 100 t for the last five years.

What catches of sharks are estimated from these fin transactions? If the dry fins are assumed to be three percent of total weight of a shark, [see Editor's note below] the catches estimated from the exports in 1990 are 180,000 t. This estimate is almost equivalent to the catches from east Asian countries. Figures for the exports and imports of shark fins for Hong Kong and Singapore are much larger than the catches of elasmobranchs in the countries. Though the Philippines and Taiwan land large catches of sharks, they do not trade shark fins. Landings of elasmobranchs in China and Viet Nam are not published in FAO Fishery Statistics, but these countries do trade in shark fins.



Editor's note: *The Fishery Management Plan for Sharks of the Atlantic Ocean* (NMK, NOAA, US Dept of Commerce, 1993) estimates a fin yield of 0.7%, and *Shark Fisheries in the Maldives* (Anderson and Ahmed, 1993) a yield of 1.45%: total shark catches of 770,000 and 370,000 t respectively.



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### Bibliography: technical reports and publications

#### A social and economic characterization of the U.S. Gulf of Mexico recreational fishery.

M.R. Fisher & R.B. Ditton, 1994. *Marine Fisheries Review*. 55(3): 21-27.

Abstract: "A mail survey of tournament shark anglers and party boat shark anglers was completed to examine their fishing activity, attitudes, trip expenditures and consumer surplus. A sample of 700 shark anglers was selected from tournaments in the Gulf of Mexico during 1990, and a sample of party boat shark anglers was drawn from Port Aransas, Tex., party boat anglers during the summer of 1991. A response rate of 58% (excluding nondeliverables) was obtained from tournament anglers. The sample of party boat shark anglers was too small to provide useful results. Tournament shark anglers reported fishing an average of 58 days per year and targeted sharks and other large marine species. Tournaments occupy a small portion of their fishing effort. If this group of anglers were not able to fish for sharks, one-third indicated no other species would be an acceptable substitute, while others were willing to substitute other large marine species. Shark trip expenditures averaged \$197 per trip with a consumer surplus of \$111 per trip. Based on Marine Recreational Fishery Statistics Survey (MRFSS) estimates of the number of shark fishing trips, we estimate a total of \$43,355,000 was spent by shark anglers in the Gulf of Mexico with a consumer surplus of \$23,865,000 for a total gross value of the shark fishery of \$66,220,000. MRFSS estimates of the number of sharks landed indicate an equivalent use value of \$183 per shark."

The paper also compares these figures with the \$500,000 annual cost of enforcing commercial and recreational fisheries under the Fishery Management Plan for Sharks of the Atlantic Ocean, 1992 (NMFS, NOAA), and concludes that the gross use value of the Gulf of Mexico recreational fishery would appear to justify this expenditure, since it results in a net benefit to the nation when the management costs are subtracted.

#### World checklist of living chondrichthyan fishes

Leonard Compagno, Vice Chairman, IUCN Shark Specialist Group  
 Sub-equatorial African Region

This checklist has recently been drafted and is now available for comment by other researchers involved in the taxonomic section of the Shark Action Plan (contact the editor for a copy). Once their comments have been incorporated, sponsorship will be sought to enable the final list to be circulated with a future issue of *Shark News*.

Dr. Leonard J.V. Compagno, Curator of Fishes, Shark Research Center, Department of Marine Biology, South African Museum, P.O. Box 61, Cape Town, South Africa,  
 Telephone: (+27) 21-24-3330. FAX: (+27) 21-24-6716. eMail: alxrac01@uctvax.uct.ac.za

Proceedings of the second European Shark and Ray Workshop. Tag and release

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**schemes and shark and ray management plans.**

S.L. Fowler and R.C. Earll (editors) 1994.

This document presents papers and abstracts of presentations made at the tagging workshop and other papers of European (North-east Atlantic and Mediterranean) interest subsequently sent to the editors by participants. The workshop recommendations are also summarised. They include the need to improve regional and international shark fisheries management, establish an international shark conservation and management programme, and set up a European Elasmobranch Working Group. Copies are available from Dr Clare Eno, JNCC, Monkstone House, City Road, Peterborough PE1 1JY. UK.

**SSG Funding  
Acknowledgements**

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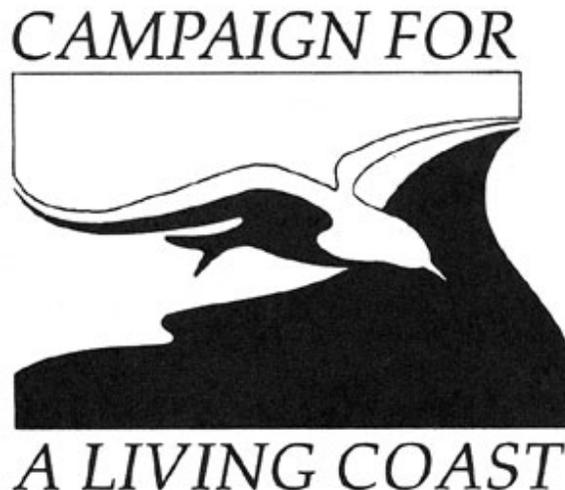
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### Campaign for a Living Coast

Following the success of the first edition of this new publication, English Nature is pleased to sponsor the second edition of *Shark News*. We wish it continued success and hope that it will provide a focus for the exchange of information within the Shark Specialist Group and with other interested parties.



In 1992 English Nature set out a long-term conservation programme to achieve effective solutions to the over-exploitation and lack of proper care which now threatens our coasts and estuaries, and many of the species living in the seas around them. As the 'Campaign for a Living Coast' continues, issues such as coastal protection and development, sustainable management of estuaries and the promotion of sensitive marine areas as a form of conserving important areas for marine wildlife are being addressed.

Within our work, commercial and recreational fisheries have been recognised as an area where both like-minded and opposing views exist in relation to the conservation of marine wildlife. In order to develop better understanding of fisheries and their potential impacts, English Nature has developed policies on particular areas of concern. One of these policies advocates a review of priorities for research, stock assessment and management protocols for sharks, skates and rays. These non-quota species are subject to particular pressure as a result of their slow growth, time taken to reach maturity and the production of small numbers of young which are vulnerable to fishing from birth. Despite these facts, fisheries for such species lack any form of conservation regulation in Britain.

If you are able to provide any information that would help in our work, please contact Paul Knapman, Marine Fisheries Officer, English Nature, Northminster House, Peterborough, Cambridgeshire PE1 1UA, UK. Tel. (44) (0) 733 318298.

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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 Technical Consultation on the Code of Conduct for Responsible Fisheries.** Rome, Italy. 26 September-5 October 1994.

The code contains six thematic areas for which guidelines are to be developed: Fishery management practices, Fishing operations, Aquaculture development, Integration of fisheries into coastal area management, Fair trade practices (including post-harvest practices), and Fisheries research. The Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas was to form an integral part of the Code, which will also take into account the 1992 Rio Declaration, Agenda 21 of UNCED, and the outcome of the UN Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks.

#### **CITES, 9th Meeting of the Conference of Parties.**

Fort Lauderdale, Florida, USA. 7-18 November 1994.

There are no marine species proposals for this meeting, although the United States National Marine Fisheries Service is preparing a discussion brief for the Agenda item on Trade in Shark Parts and Products. This is intended to encourage discussion on how best to collect data on international trade in shark parts and information on the impact of international trade on shark populations and marine ecosystems.

#### **FAO Committee on Fisheries biennial meeting.**

20-24 March 1995.

The reviewed draft text of the Code of Conduct for Responsible Fisheries (see opposite) will be submitted to this meeting.

#### **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.

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