

# SHARK NEWS

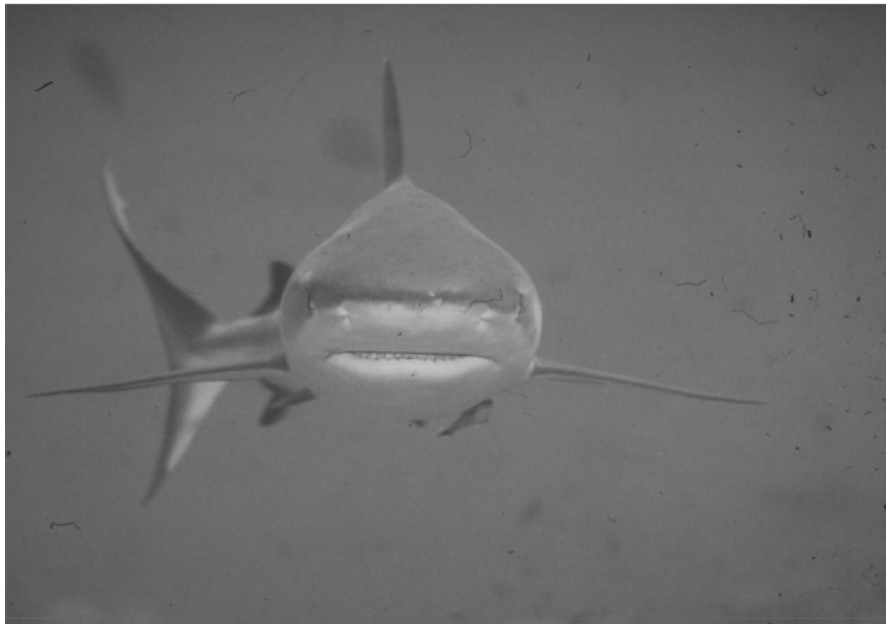
SHARK NEWS 10 NEWSLETTER OF THE IUCN SHARK SPECIALIST GROUP JANUARY 1998

## Shortage of sharks at Chagos

Charles Anderson, Charles Sheppard, Mark Spalding and Ron Crosby

### Introduction

The Chagos Archipelago is an isolated group of atolls and reefs in the central Indian Ocean. The group forms the southern end of the Laccadives-Maldives-Chagos atoll chain, and is centred at about 6°S 72°E. There are five atolls, ten other shallow reef banks and submerged shoals and about 50 islands. The islands are uninhabited, apart from Diego Garcia which houses a US military base. The Chagos Archipelago is a possession of the United Kingdom, and is known



The grey reef shark *Carcharhinus amblyrhynchos*. One of five species of reef shark formerly common in the Chagos Archipelago, but now only rarely encountered. Photo (from the Red Sea) by Jeremy Stafford-Deitsch.

officially as the British Indian Ocean Territory (BIOT).

Access to the Chagos Archipelago is limited, partly because of the presence of the military base at Diego Garcia, and partly because of its isolation. Chagos lies roughly 500 km south of the Maldives and over 1,500 km from Sri Lanka and Seychelles. Rarely visited, and off-limits to most people, it is supposedly one of very few truly inaccessible places left in the whole world.

During the 1970s there were a series of three major diving expeditions to the Chagos Archipelago, organised through the British military (the 1972, 1975 and 1978-1979 Joint Services Expeditions). Divers on all three expeditions encountered large numbers of reef sharks (Bellamy 1979, Winterbottom, Emery and Holm 1989, Sheppard 1990).

In 1996, a British scientific diving expedition (organised by the Friends of the Chagos and Warwick University) visited the

Chagos, after a lapse of 17 years since the last similar expedition. It was expected that comparable numbers of sharks would be seen in 1996 as had been seen in the 1970s, but this was not the case.

The aim of this report is to document and, as far as possible, quantify a dramatic decline in reef shark abundance in the Chagos.

### Methods

Qualitative information about shark abundance in Chagos waters during the 1970s was obtained from several expedition divers (see Acknowledgements). Charles Sheppard took part in the 1975 and 1978-1979 expeditions, while Ron Crosby took part in the 1978-1979 expedition. All four authors took part in the 1996 expedition.

Quantitative information about shark abundance in Chagos was obtained from divers' logbook records. Fairly consistent logbook records of shark sightings were kept during the 1975 expedition by Charles Sheppard and during the 1978-1979 expedition by Ron Crosby. Although these data are not complete, records were kept of most shark sightings, of all sightings of large numbers of sharks, and of unusual occasions when no sharks were seen. It is assumed that one shark was seen on each dive for which shark numbers were not recorded. Complete records of shark sightings during dives were kept by Charles Anderson and Mark Spalding during the 1996 expedition.

### Results

#### *The situation in the 1970s*

Divers who visited the Chagos in the 1970s noted that reef sharks were very abundant. Sharks were seen on almost every dive, a few (1-2) on reefs inside the atolls, more (5+) on outer atoll reefs, and most (50+) on some particular sites such as submerged banks. This abundance of sharks at the

Chagos in the 1970s has been previously reported by Bellamy (1979) and Sheppard (1990). The sharks were sometimes over-inquisitive, and a number of precautions had to be taken when diving. At different times these included:

- ✦ Not free-swimming in midwater or at the surface over deep water.
- ✦ Not entering the water for several minutes after arriving at a dive site, in order to give time for sharks attracted by the sounds of the engine and anchor to disperse.
- ✦ Anchoring dive boats in shallow water so that divers could ascend from the bottom and exit the water quickly, spending as little time as possible in mid-water.
- ✦ Having a drop line from the anchored dive boats from which underwater cameras and other equipment could be hung in order to distract sharks while divers got out of the water.



### Also in this issue ...

Threat to sharks in the Bijagos Archipelago Biosphere Reserve  
FAO consultation on the conservation and management of sharks

Fishery for the shortfin mako in southern Brazil

### Next issue ...

Recreational importance of elasmobranchs

- Having one diver in each party armed with a stick and assigned as a 'shark guard' to ward off sharks that approached too closely.
- Taking particular care when diving in the late afternoon (when sharks were especially active and sometimes aggressive) and when diving on submerged banks (where sharks were especially abundant).

Logbook records of shark sightings maintained by Charles Sheppard and Ron Crosby are summarised in Table 1. Note that neither data set is complete. Records of shark sightings were not kept for over one third of all dives; most of these were on reefs within the atoll lagoons where shark sightings were less common than at other localities. It is assumed that an average of one shark was seen on each of these dives. This assumption may distort the estimate of true shark abundance, but if it results in an overestimation this will be of less than 0.4 sharks per dive at most. This assumption will also tend to reduce variance.

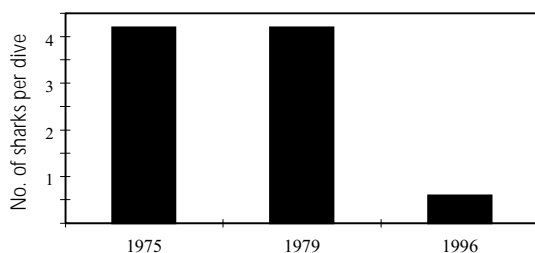
## Findings in 1996

It very quickly became apparent that reef sharks were no longer abundant in the Chagos. On most dives none or only one or two sharks were seen. None of the 'anti-shark' precautions used during the 1970s expeditions had to be employed. A total of 13 species of shark have been recorded from the Chagos to date (Winterbottom and Anderson 1997), of which five species of shark were positively identified during dives by the divers who kept records of shark sightings on the 1996 Chagos Expedition:

- Tawny nurse shark *Nebrius ferrugineus* (Lesson, 1830)
- Silvertip shark *Carcharhinus albimarginatus* (Rüppell, 1837)
- Grey reef shark *Carcharhinus amblyrhynchos* (Bleeker, 1856)
- Blacktip reef shark *Carcharhinus melanopterus* (Quoy and Gaimard, 1824)
- Whitetip reef shark *Triaenodon obesus* (Rüppell, 1837)

A summary of 1996 shark sightings is provided in Table 2. Shark sightings in atoll channels are lumped in the 'outside' category. A single dive on Victory Bank by the senior author produced no shark sightings; the time spent (one hour) is lumped under Great Chagos Bank. Shark sighting rates (i.e. numbers of sharks seen per

Figure 1. Average number of sharks seen per dive in the Chagos, by year



hour) by location and species are given in Table 3.

## Discussion

From divers' logbook records, the shark sighting rate for the period 1975–1979 is estimated at roughly  $4.2 \pm 0.3$  sharks per dive. In contrast, the shark sighting rate in 1996 was only  $0.6 \pm 0.1$  sharks per dive (Table 1; Figure 1). If it is assumed that shark sightings are a reasonable index of shark abundance, then this suggests that shark numbers in 1996 had been reduced to about one seventh (14%) of their numbers in the 1970s.

The data on which these results are based are subject to some difficulties of interpretation. In the three sample years, dives were

Table 1. Summary of shark sightings by divers in the Chagos

Year	1975	1979	Subtotal 1975+1979	1996	1996	Subtotal 1996
Observer	CRCS	RC	CRCS & RC	RCA	MDS	RCA & MDS
No. dives	67.0	140.0	207.0	45.0	68.0	113.0
No. sharks	281.0	593.0	874.0	17.0	49.0	66.0
<b>No. sharks/dive</b>	<b>4.2</b>	<b>4.2</b>	<b>4.2</b>	<b>0.4</b>	<b>0.7</b>	<b>0.6</b>
1.96 SE (shks/dive)	0.5	0.3	0.3	0.2	0.2	0.1

not made at exactly the same locations (although they were made at the same season). This may have caused some slight error, although it is not believed to have caused any obvious bias. The assumptions made to account for incomplete data sets from the 1970s are noted above and are another potential source of error. However, the fact that the estimates of shark sighting rates by divers for 1975 and 1979 are in such good agreement does suggest that they are not without value. Furthermore, although these problems may affect the precise estimates of shark abundance, they do not disguise the fact that there has been a substantial decrease in shark sightings.

Two further potential sources of error relate to consistency of dive length and diver vigilance. For the former an overview of logbook records suggests that these were generally comparable between the three years. Similarly, it is the authors' opinion that diver vigilance would have been broadly comparable in all three years. All observations were made by experienced divers, all of whom had specific tasks to perform during most dives, but who nevertheless had sufficient time and interest to scan the surrounding waters at

Table 2. Summary of Chagos shark sightings (numbers) by divers in 1996

	Salomon (inside)	Salomon (outside)	Peros Ban. (inside)	Peros Ban. (outside)	Great Chagos B.	Diego Gar (outside)	Total
<i>N. ferrugineus</i>	0	5	2	3	5	1	16
<i>C. albimarginatus</i>	0	2	0	2	0	0	4
<i>C. amblyrhynchos</i>	0	16	3	12	7	0	38
<i>C. melanopterus</i>	1	3	2	1	0	0	7
<i>T. obesus</i>	0	1	0	0	0	0	1
<b>Total</b>	<b>1</b>	<b>27</b>	<b>7</b>	<b>18</b>	<b>12</b>	<b>1</b>	<b>66</b>
<b>Time (hrs)</b>	<b>19</b>	<b>29</b>	<b>28</b>	<b>22</b>	<b>28</b>	<b>1</b>	<b>127</b>

Table 3. Summary of Chagos shark sighting rates (sharks/hour) by divers in 1996

	Salomon (inside)	Salomon (outside)	Peros Ban. (inside)	Peros Ban. (outside)	Great Chagos B.	Diego Gar (outside)	Total
<i>N. ferrugineus</i>	0	0.17	0.07	0.14	0.18	1.0	0.13
<i>C. albimarginatus</i>	0	0.07	0	0.09	0	0	0.03
<i>C. amblyrhynchos</i>	0	0.55	0.11	0.55	0.25	0	0.30
<i>C. melanopterus</i>	0.05	0.10	0.07	0.05	0	0	0.06
<i>T. obesus</i>	0	0.03	0	0	0	0	0.01
<b>Total</b>	<b>0.05</b>	<b>0.93</b>	<b>0.25</b>	<b>0.82</b>	<b>0.43</b>	<b>1.0</b>	<b>0.52</b>
<b>Time (hrs)</b>	<b>19</b>	<b>29</b>	<b>28</b>	<b>22</b>	<b>28</b>	<b>1</b>	<b>127</b>

regular intervals.

Although only semi-quantitative, this brief study does show the potential value of selected diver logbook records as a means of gathering historical data. Divers regularly record sightings of large pelagics and other 'interesting' species. With strict assessment and control, this method could be used more widely to assess changes in abundance of some species where no other quantitative records are available.

The great decrease in shark sightings by divers between the 1970s and 1996 is believed to reflect a real decrease in shark numbers. This is almost certainly due to fishing. Prior to the 1980s there had been very limited shark fishing in the Chagos (Sheppard 1990). Since then, an agreement between the governments of



## Editorial – News from the Shark Group

Britain and Mauritius (which has a political claim on the Chagos) has allowed Mauritian reef fishermen to operate in the archipelago under licence. These fishermen visit the Chagos during the rough season around Mauritius, i.e. in the middle of the year. They apparently target finfish, but must also catch some sharks.

In addition, Sri Lankan fishermen visit the Chagos illegally. Two Sri Lankan fishing boats from Negombo were arrested by the British Indian Ocean Territory (BIOT) fisheries patrol vessel at the end of January 1996. Both had large catches of sharks on board (pers. obs., McDonnell 1996). The vessels were impounded. Fishing gear was seized from two other vessels (McDonnell 1996). In Sri Lanka there is strong local demand for shark meat, and of course shark fins are much sought after as an export commodity.

Although all species of reef shark seem to have been affected by this fishing activity, they do not appear to have been affected equally. The silvertip shark *Carcharhinus albimarginatus* was the most abundant reef shark seen in the 1970s (Winterbottom, Emery and Holm 1989, R. Winterbottom pers. comm. April 1996). In 1996 it had been reduced to fourth in order of abundance (Table 3). This disproportionate decrease in silvertip shark numbers might be a reflection of this species' more inquisitive and/or aggressive nature (compared to the other common reef species at Chagos) making it more vulnerable to fishing mortality.

In most parts of the world, reef shark populations have been reduced to a fraction of their original sizes. There are very few locations where shark numbers remain high. Ironically, one of the few is Bikini Atoll in the Marshall Islands (Curtsinger 1995) where fishing has not been carried out for 50 years following nuclear tests. At Bikini Atoll, numbers of reef sharks are presumably at a 'natural' level that would have been the norm for most similar sites throughout the Indo-Pacific for millions of years until this century.

Until the 1996 Expedition it had been thought that the Chagos too had escaped the worst effects of the worldwide collapse of shark stocks, as a result of its isolation. However, it is clear that 'isolated' is a relative term. For many modern Indian Ocean fishermen Chagos is no longer seen as a remote location, but rather as a prime fishing ground. It is also clear that if the coral reefs of the Chagos are to be preserved in a pristine condition, as many hope, greater efforts will have to be made to control fishing of the reefs' top predators.

### Acknowledgements

The 1996 Chagos Expedition was organised by The Friends of the Chagos, London. We are most grateful to John Griffiths, Peter Ormerod, Don Phillips, Ralph Rayner, Ann Sheppard and Rick Winterbottom for providing anecdotal information about sharks in the Chagos during the 1970s.

### References

- Bellamy, D. 1979. *Half of Paradise*. Cassell, London.
- Curtsinger, B. 1995. Close encounters with gray reef sharks. *National Geographic* 1/95: 45–67.
- McDonnell, A. 1996. BIOT fishing. *Chagos News* (Newsletter of the Friends of the Chagos, London) 7: 6–8.
- Sheppard, C.R.C. 1990. Chagos. In: Wells, S., and Sheppard, C.R.C. *Coral Reefs of the World. Vol. 2. Indian Ocean*. pp. 37–46.
- Winterbottom, R., and Anderson, R.C. 1997. A revised checklist of the epipelagic and shore fishes of the Chagos Archipelago, central Indian Ocean. *Ichthyological Bulletin of the J.L.B. Smith Institute of Ichthyology* 66: 1–28.
- Winterbottom, R., Emery, A.R., and Holm, E. 1989. An annotated checklist of the fishes of the Chagos Archipelago, central Indian Ocean. *Royal Ontario Museum, Life Sciences Contributions*, 145: 1–226.

It has been another extremely busy six months since preparing the last issue of *Shark News*, and we apologise for the long wait between publications. This issue is also a bit shorter than usual, due partly to difficulties obtaining funds for printing and distribution (suggestions for potential sponsors for the next issue would be most welcome).

As the last issue was going to press, we were about to leave for the two-week CITES meeting in Zimbabwe, in June, where sharks were among the more controversial issues up for debate. The results of this meeting are described on page 5. While disappointing in some respects, the outcome has resulted in considerable Shark Specialist Group (SSG) activity associated with the FAO Consultation on the conservation and management of sharks. Members of the SSG are participating in the regional workshops (see below) which are being held in advance of the main Technical Working Group meeting scheduled to take place in April 1998 in Japan, before the main Technical Consultation planned for October or November 1998.

The CITES meeting was followed almost immediately in July by the international Seminar and Workshop in Sabah, Malaysia, marking the end of the UK Darwin Initiative-funded project on Elasmobranch Biodiversity, Conservation and Management, headed by SSG Co-chair Sarah Fowler. This was attended by nearly 60 participants from 14 countries, including many SSG members, with many of the overseas participants funded by a World Bank Small Grant Program award. The proceedings of this meeting are currently in preparation.

The following month saw Co-chair Jack Musick chairing a two-day American Fisheries Society symposium on Long-lived Marine Animals during the AFS annual meeting in Monterey, California. In addition to papers on shark fisheries and population genetics, species covered included sea turtles, groupers and other K-selected teleosts, cetaceans, seals and long-lived marine molluscs. These proceedings will also be published in due course.

Back in Europe, Sarah Fowler was heavily involved in the preparation for the September launch of the newly established charity, the Shark Trust (UK member of the European Elasmobranch Association). Both of these organisations are being run from Sarah's office for the next two years.

Preparations then began for the 5th Indo-Pacific Fish Conference, held in Noumea, New Caledonia, in November. This was attended by several SSG and some TRAFFIC network members, many of whom were assisted financially by IUCN funds allocated to the work of the SSG by the US government. We were therefore able to hold a Shark Specialist Group meeting (the minutes of which will be available soon, including the revised and agreed SSG Terms of Reference and membership policy) and contribute to the first of several two-day regional workshops supporting the FAO consultation process (see page 5). The Noumea meeting covered the Indo-Pacific region, and was followed by December meetings in Florida and Monterey for the western North Atlantic and Eastern North Pacific regions.

Meanwhile, back in the office, the IUCN Species Survival Commission's membership package has finally arrived. This has enabled us to begin the process of reconstituting the membership of the SSG for the current triennium, which ends in 2000. Regional Vice-Chairs are currently reviewing their membership lists, deleting inactive members, confirming those who should be reappointed, and identifying new members. Once this process has been completed, SSG membership invitations will go out, along with a complete list of the Shark Specialist Group membership for the next few years. Active members will receive their invitations to rejoin shortly.

Sarah Fowler and Jack Musick, Co-chairs

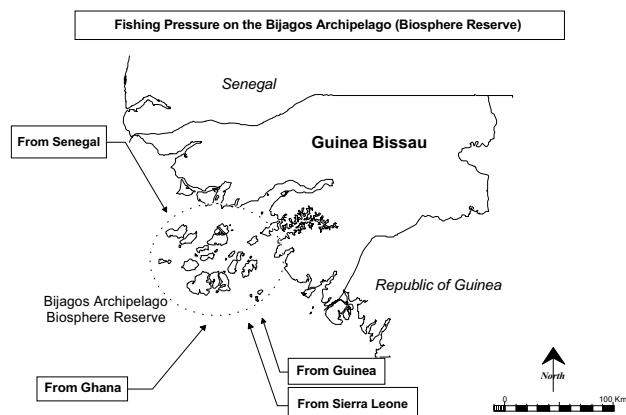


# Shark populations are possibly under serious threat in the Bijagos archipelago (Biosphere Reserve), Guinea Bissau, West Africa

P. Tous<sup>1</sup>, M. Ducrocq<sup>1</sup>, D. Bucal<sup>2</sup> and E. Feron<sup>1</sup>

In the Bijagos archipelago of Guinea Bissau (declared a Biosphere Reserve in April 1996), sharks and other cartilaginous fish have never been the target of sustained fishing by the small-scale indigenous fishermen. The unavailability of sophisticated equipment, the absence of a local market for the product and traditional beliefs (these animals are still considered by the Bijagos to hold mysterious powers and are consistently represented in religious activities in the form of masks, dances, and wall paintings) had made the archipelago a safe breeding ground for cartilaginous fish.

The growth of the shark fin market in the region over the last decade, for export to the far east, has prompted specialist fishermen from neighbouring Senegal and Guinea, or from further away in Sierra Leone and even Ghana, to come to the archipelago to catch cartilaginous fish. These professionals are well-organised, and use sophisticated and efficient sailing and catching equipment. Highly specialised, they only harvest the fins, which are sun-dried or smoke dried on island beaches, and discard the rest of their catch. On occasions, large quantities of rotting sharks have been found on beaches.



In the absence of consistent scientific data on the existing populations and because of the poor national capacity for law enforcement, the increased pressure that these new activities have caused has raised considerable concern for the sustainability of this industry, the loss of national resources from Guinea Bissau and the archipelago in particular, and the survival/conservation of the target species. Indeed, all actors present in the archipelago seem to agree on the fact that the populations of cartilaginous fish have undergone significant modifications over the last five years or so.

The IUCN Guinea Bissau Programme, in partnership with the national Centro de Investigação Pesqueira Aplicada (Centre of Applied Fisheries Research), organised a two-month mission to set up a monitoring mechanism for the cartilaginous fish of the archipelago. All of the seven private game fishing operations who rely heavily on shark fishing for their business and some of the artisanal fishermen participated in this preliminary undertaking.

Initial surveys provided some valuable yet fragmented information. For example, in the case of the great hammerhead shark *Sphyrna mokarran*, catches of juveniles seem to be increasingly frequent and most of the adults caught are pregnant females. The bull shark *Carcharhinus leucas* and the milk shark *Rhizoprionodon acutus* seem to be more frequently caught than before. For the blacktip shark *Carcharhinus limbatus*, catches of adults, particularly of pregnant females, have become exceptional and juveniles of birth size constitute over one third of the small sharks found during the survey of fishing catches at local harbours. The populations of guitar fish *Rhinobatos rhinobatos* and *R. cemiculus*, up to now the main targets of the specialised fishing teams, seem to have diminished substantially.

Although it is still too early to draw definite conclusions for all the above species, the situation seems to be clearer and more alarming for others. The three species of saw-fish *Pristis microdon*, *P. pectinata* and *P. pristis* have not been reported at all for several years and it is thought that the genus is locally extinct.

The economic significance of this sector of activity is substantial. Indeed, on the basis of the declared catches of the industrial fishing operators and past surveys of the artisanal fishing sector, together with calculations of the profitability threshold of specialised ships, it is possible to estimate the overall catches of cartilaginous fish within the Bissau Guinean EEZ to circa 25,000 tons per year. This represents a yearly production of around 250 tons of dried fins exported from the archipelago to neighbouring countries. The price paid for this product by traders in the region varies between US\$50 and US\$80 per kg, depending on the species. The total turnover of this trade would be of around US\$16 million per year, yielding no benefit at all to Guinea Bissau and no return to the monitoring of the status of the resource base.

At regional level, Mauritania is also witnessing increased pressure on cartilaginous fish. In particular, the local Imraguen fishermen traditionally specialising in white mullet *Mugil curema* are being forced by the diminishing stocks to convert to other activities, including the catching of cartilaginous fish.

To follow up on the results of the mission, IUCN Guinea Bissau and the Fondation Nationale du Banc d'Arguin in Mauritania, in collaboration with the national institutions in their respective countries, are currently initiating a joint three-year research programme for the monitoring of the shark populations in the Banc d'Arguin National Park and the Bijagos archipelago Biosphere Reserve. It is expected that this programme will result, in 1999, in the formulation of national conservation plans and policies within the framework of new IUCN West Africa Regional Marine Conservation network.

Eric M. Feron  
Conseiller Scientifique et Technique Principal  
IUCN Guinee Bissau  
AP 23, 1031 Bissau Codex, Guinee Bissau, Afrique  
Tel. : + 245 20 12 30 Fax : + 245 20 11 68  
Article submitted July 1997

## Editor's note: West African regional meeting on coastal zone management, Bissau, 10–15 November 1997

A paper on exploitation of sharks in the West African region, with particular emphasis on Guinea-Bissau (see above), was presented by Philippe Tous of IUCN Guinea-Bissau in Bissau in November. Although a representative of the Shark Specialist Group was invited to attend the African meeting, this was unfortunately impossible due to the overlap of this meeting with the Shark Specialist Group meetings and workshop in Noumea, New Caledonia. We may be able to report on the African meeting in a future issue of *Shark News*.

<sup>1</sup> IUCN Guinea Bissau, AP 23 Bissau Codex 1031, Guinea Bissau. Tel: + 245 20 12 30. Fax: + 245 20 11 68. Email: uicn.bi@sol.telecom.gw

<sup>2</sup> CIPA CP 102, Bissau, Guinea Bissau. Tel: + 245 21 16 95. Fax: + 245 20 11 57.



# Sharks and CITES – the outcome

The following subjects were debated at the 10th meeting of the Parties to the Convention on International Trade in Endangered Species, in Zimbabwe in June 1997. (The last issue of *Shark News* (9:6–7) gives the background to the Conference's discussions on international trade in sharks and related species.)

## 1. The CITES Animals Committee report *Biological and Trade Status of Sharks*

Shark Specialist Group co-chair Dr John Musick presented an intervention at the CITES meeting on behalf of this report, which was adopted in full by the Parties. Its detailed recommendations were set out in full in the last issue of *Shark News* (9:7) and are not copied again here. They mainly concerned the need for improved species-specific fishery, trade, and biological data by all Parties and UN FAO, and an increase in research and management efforts for elasmobranchs. Many of those relating to FAO's work programme have already been taken up (see below), although the Shark Group is extremely concerned over the apparent absence of the preparation of the batoid catalogue from the current FAO work programme.

The concluding recommendation was for the CITES Secretariat to communicate the relevant recommendations to FAO and other management and/or research organisations and establish liaison with these bodies to monitor implementation. The new information derived from their research and monitoring programmes will be submitted to the 11th Conference of the Parties at the end of the century.

## 2. Proposal to list sawfish on Appendix 1

This proposal for the listing of all species of sawfishes (Pristiformes) on Appendix I (which would prohibit international trade in the group) was unsuccessful. The status of sawfish populations is considered to be threatened worldwide, because of their extreme vulnerability to bycatch at all ages in net fisheries. Additionally, their high value fins and saws do enter international trade. However, population and trade data are scarce. The Conference considered that trade in sawfish parts was not the major factor driving the population decline and that an Appendix I listing was not warranted.

## 3. Marine Fish Species Working Group

The US proposal for the establishment of a Working Group to prepare an analysis of implementation concerns associated with the inclusion in Appendix II of marine fish species subject to large-scale harvesting and international trade, and to develop recommendations for the 11th Conference, was defeated after hot debate.

## FAO activities arising from the CITES resolution

FAO commenced work on the collection of biological and trade data on sharks following the 9th CITES meeting in 1994. A special enquiry was undertaken to countries on shark fisheries in the autumn of 1996, and a consultant reviewed all available biological and shark fishery data. Additionally, FAO is reviewing the trade status of sharks and shark parts; has commissioned a study on species identification using DNA analysis, and the preparation of case studies on shark fishery management; and is updating the 1984 shark species catalogue and its technical paper on shark utilisation.

Finally, the 1997 Commission on Fisheries meeting in FAO HQ in Rome proposed to organise an expert consultation with Japan and the US on conservation and management of shark populations.

The above section was extracted from Visser, T. In press. *FAO Initiatives for elasmobranch fisheries research and monitoring*. In: Proceedings of meeting on Elasmobranch biodiversity, conservation and management, Sabah, July 1997.

# FAO consultation on the conservation and management of sharks

In 1994, the Ninth Conference of Contracting Parties of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) adopted a Resolution on the Biological and Trade Status of Sharks (Conf. 9.17), requesting *inter alia* that

- (1) FAO and other international fisheries management organisations establish programmes to collect and assemble the necessary biological and trade data on shark species; and
- (2) all nations utilising and trading specimens of shark species to cooperate with FAO and other international fisheries management organisations.

The Code of Conduct for Responsible Fisheries adopted by the FAO Conference in November 1995 and the Kyoto Declaration and Plan of Action of December 1995 both call for the conservation of biological diversity and the sustainable use of its component species, as well as the minimisation of waste and discards. In FAO, activities which intend to promote these objectives are in progress under a project funded by the Government of Japan. It contributes *inter alia* to the study of the biological and trade status of sharks.

At its session in 1997, the FAO Committee on Fisheries (COFI) suggested that FAO organise, in collaboration with Japan and the United States, using extra-budgetary funds, a consultation of experts to develop and propose guidelines leading to a Plan of Action for Shark Conservation and Management. The Tenth Meeting of the CITES Contracting Parties, which met in Harare, Zimbabwe, in June 1997, received the news of this initiative with great appreciation.

Preparations are underway for convening a Technical Working Group (TWG) of experts to be followed by an open-ended intergovernmental Technical Consultation. The ultimate aims of this endeavour are: (1) to determine the **specific requirements** for sustainable global and regional management of shark species; (2) to develop **guidelines** for such management; and, (3) to develop a **Plan of Action** aimed at promoting the widespread use of these guidelines by appropriate management bodies and arrangements (at national, and/or regional, and/or international levels).

The TWG, scheduled to meet in April 1998 in Japan, will discuss draft guidelines and a draft plan of action to be submitted to the Technical Consultation scheduled for October or November 1998 in Rome. The results of the Consultation will be submitted for adoption to FAO's Committee on Fisheries scheduled to meet in early 1999.

It is expected that the Plan of Action would be addressed to Member Nations and to international fisheries management organisations or arrangements. It is foreseen that it would contain strategies aiming:

- to strengthen the availability of information on shark stocks and shark fisheries globally;
- to indicate priorities for how to allocate public resources to secure the minimum, essential information required for management of shark fisheries;
- to develop a global approach (for national governments, regional and international management organisations) in addressing global priority issues in conservation and management of sharks, including the reduction of discards where practicable; and
- to monitor the implementation of shark fishery management.

Extracted from FAO Press release. For more information contact: Mr Hideki Tsubata, Fishery Agency of Japan, email <tsbthdk@s.affrc.go.jp> Mr Dean Swanson, US National Marine Fishery Service, email <dean.swanson@noaa.gov> or Mr Erhard Ruckes, Fishery Industries Division, FAO, Italy, email <erhard.ruckes@fao.org>.



# Fishery for the shortfin mako *Isurus oxyrinchus* in southern Brazil

Fábio E. S. Costa, Francisco M. S. Braga, Alberto F. Amorim and Carlos A. Arfelli

The shortfin mako *Isurus oxyrinchus* is one of the most common shark species on the Brazilian coast and in other parts of the world, and among the main species of sharks caught commercially in the North Atlantic, Pacific and Brazilian coast. Nevertheless, there are few studies on the shortfin mako fishery.



Shortfin mako *Isurus oxyrinchus* with parasitic copepods streaming off dorsal fin. Photo: Jeremy Stafford-Deitsch.

The main fishing effort on this species is by longliners. Based on the same data sources used in the present paper, Amorim & Arfelli (1992) and Amorim *et al.* (in press) found that the main species of sharks caught by Santos (SP) longliners were: *Prionace glauca* (blue shark), *Isurus oxyrinchus* (shortfin mako), *Alopias superciliosus* (bigeye thresher), *Sphyrna lewini*, *S. zygaena* (hammerhead sharks), and 11 species of *Carcharhinus*. From 1971 to 1975, sharks represented 13.5% of the total yield of these boats (10 t/year). This percentage reached 51% of the total catch in 1985.

The mako shark fisheries by Santos (SP) longliners (operating in the area 18°–33°S / 35°–51° W) from 1971 to 1990 were studied. The annual catch in dressed weight (without head, gut, gill and fins) fluctuated from 13.3 t in 1975 to 138.3 t in 1990, and average weight of sharks ranged from 41 kg (1984) to 51.2 kg (1977). Fishing effort has increased from 430 thousand hooks (in 1972) to 3 million (in 1990). Catch per unit effort (CPUE, number per thousand hooks) ranged between 0.6 (1982) and 1.8 (1988). The lowest monthly cumulative catch occurred in February (45 t and 869 fishes) and the highest in November (116 t and 2,643 fishes). The monthly cumulative fishing effort ranged from 1.3 million (February) to 2.7 million (November). CPUE ranged from 0.4 (January) to 1.1 (September) fish per thousand hooks. From April to November, catches in weight and number were higher, but the average weight of sharks decreased.

The highest annual frequencies of pectoral-caudal length were in the classes between 90 and 150 cm, and mainly from 110 to

130 cm. The length-frequency distribution of pectoral-caudal length in the period 1971–1990 showed high frequencies in the classes from 80 to 150 cm, with the highest in the classes of 110, 120 and 130 cm. The largest amplitude of pectoral-caudal length was seen in the fourth quarter, ranging from 40 to 250 cm. Therefore, the highest frequencies were concentrated in the length classes of 90 to 150 cm in all quarters.

The pectoral-caudal length (Lc)/dressed weight (Dw) was:  $Dw = 5.69 \cdot 10^{-5} \cdot Lc^{2.85}$  ( $r^2 = 0.847$ ). The relationship total length/pectoral-caudal length was:  $Lc = 0.277 \cdot TL^{1.15}$  ( $r^2 = 0.997$ ) (Figure 2).

Pratt and Casey (1983) give the average total length at maturity of female shortfin mako as about 258 cm. According to Compagno (1984) females become mature at 280 cm, while males mature at 195 cm total length. The corresponding pectoral-caudal length (Lc) was estimated to be over 160 cm for females, and about 120 cm for males, based on the total length/pectoral-caudal length relationship. The highest number of shortfin mako caught in the period 1971–1990 was in the length classes from 90 to 150 cm (Lc). So more than half of the total individuals caught were immature.

The increasing trend of catches of shortfin mako from 1971 to 1990, was due to a similar increase in the fishing effort.

The length-frequency distribution showed an occurrence of individuals from newborn stage to adults (near maximum length). Nevertheless, the higher abundance of small sharks indicates that the shortfin makos caught by Santos longliners are mainly young individuals. The fact that this fleet catches mainly immature individuals, but that the average length did not show a decreasing trend, probably indicates that this fishery catches only part of the shortfin mako population.

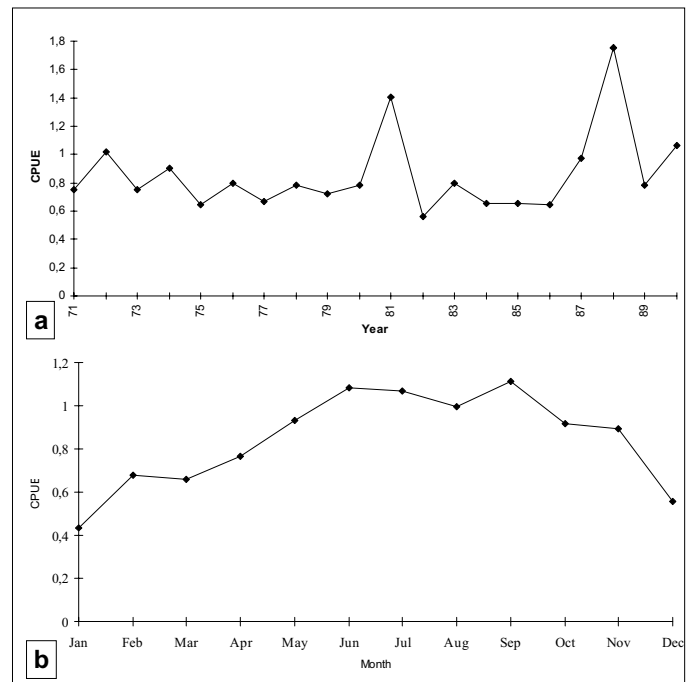


Figure 1. CPUE (number/thousand hooks) of shortfin mako caught by longliners off Southern Brazil, from 1971 to 1990. a : annual data. b : monthly data.

# Whale shark tagging, South Africa and Seychelles

The most recent report on the Shark Research Institute's (SA) whale shark tagging programme covers the two years from May 1995 to April 1997. During this period, a further 125 whale sharks were tagged, 109 off the coastline of southern Mozambique (28 of these within one 48-hour period) and 16 off the coastline of northern KwaZulu/Natal. A total of 158 sharks have been tagged since the start of the SRI programme in December 1993. There have been ten re-sightings of tagged sharks, all within days or no more than a month after tagging, and all within 7 km of their original tagging location.



Whale shark *Rhincodon typus* and diver during tagging week in the Seychelles, November 1996. Photo: Lawson Wood.

This successful record has been considerably assisted by the acquisition of a microlight by the project. Many aerial surveys have taken place, recording cetaceans and turtles as well as elasmobranchs, noting daily onshore and offshore movements of whale sharks, and helping the tagging teams to locate sharks for tagging.

There are plans to attach a satellite tag onto a whale shark during the 1997/98 season, following a practice run with a dummy tag.

The SRI whale shark project assisted in the establishment of a tagging operation in the Seychelles in November 1996. Twenty-three whale sharks were tagged over a seven-day period in collaboration with the Seychelles Underwater Centre.

The project's public awareness and educational programme has been extended with the introduction of experimental "whale shark weekends" in association with local dive tour operators in southern Mozambique. This enables divers to swim with the whale shark after it has been tagged by a member of the project team. Demand for participation in these weekends is extremely high. Divers are also offered the opportunity to 'adopt' a whale shark, with income from adoption fees being used to finance further research.

The project also monitors whale shark strandings and collects tissue samples.

For more information contact Andrew Gifford, Shark Research Institute, P.O. Box 510, Botha's Hill, Natal 3660, South Africa. Tel/fax: (031) 701 9842 or visit the SRI web page: <http://www.sharks.org>

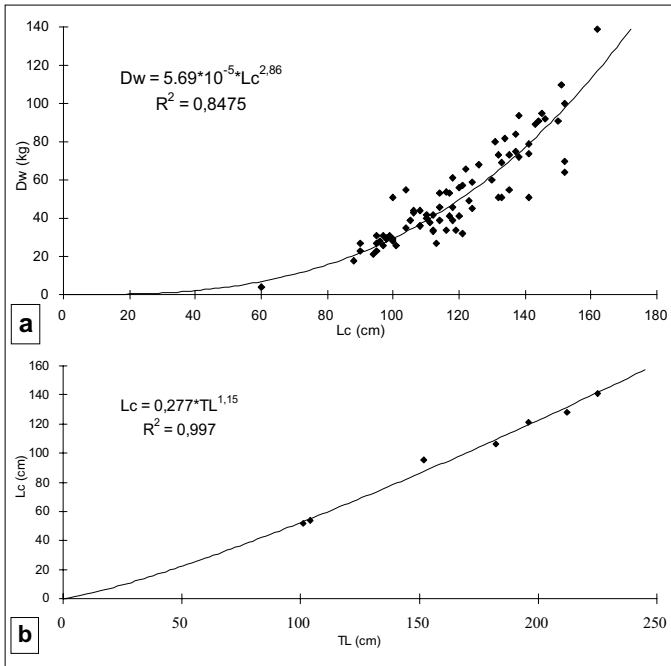


Figure 2. a : Dressed weight (Dw) / pectoral-caudal (Lc) relationship.  
b : Total length (TL) / pectoral-caudal (Lc) relationship.

The distribution of the average size of the individuals along the year, showed that the period from July to September corresponded to the period of the fishery recruitment of the shortfin mako, for the area under study.

## References

- Amorim, A.F., and Arfelli, C.A. 1992. The shark fishery in south and southeastern Brazil. *Chondros* 3(3): 1-2.
- Amorim, A.F., Braga, F.M.S., Fagundes, L., Costa, F.E.S., and Arfelli, C.A. In press. The evolution of tuna fishery in Santos-São Paulo, Southern Brazil (1971-95) In: *Collective Volume of Scientific Papers*. ICCAT, Madrid.
- Compagno, L.J.V. 1984. Sharks of the world. An annotated and illustrated catalogue of shark species known to date. *FAO Fish. Synop.*, Rome, FAO, v.4, n.125 (parts 1 and 2). 665 pp.
- Pratt Jr., H.L. and Casey, J.G. 1983. Age and growth of the shortfin mako, *Isurus oxyrinchus*, using four methods. *Canadian Journal of Fisheries and Aquatic Sciences* 40(11): 1944-1957.
- Summarised from: Costa, F.E.S., Braga, F.M.S., Amorim, A.F., and Arfelli, C.A. 1996. Fishery analysis on shortfin mako, *Isurus oxyrinchus*, off Southeast and South of Brazil (Elasmobranchii, Lamnidae). *Arq. Ciên. Mar. Fortaleza*, 30(1-2): 5-12.

Fábio Edir dos Santos Costa  
UNESP - Departamento de Zoologia  
Av. 24-A, n. 1515 - Bela Vista, 13506-900 - Rio Claro (SP) - Brazil  
Email: <cbmansur@linkway.com.br>

## Painted ray *Raja undulata* reproduction

A pair of adult painted rays were observed copulating in the Benalmádena Sea Life Centre in Spain on 23 December 1996. The female started laying eggs 25 days after mating, on 17 January 1997, and continued to lay until 4 April, by which time she had produced 88 eggs. The first 14 cm (TL) skate hatchling appeared on April 18, 91 days after being laid, and 116 days after copulation.

Francisco José Pinto de la Rosa, Sea Life Centre,  
Benalmádena, Spain.





# White shark now protected

## in Western and federal waters of Australia ...

In October 1997 the Fisheries Minister for Western Australia, Mr House, announced the proposed enactment of legislation to ban both commercial and recreational catches of this species in the State. This followed moves in June to list the shark as a commercially protected species, which came into force at the beginning of October. Recreational protection should have been in force by the end of November. Commercial shark fishermen will be developing a code of conduct for handling great white sharks caught incidentally.



Great white shark *Carcharodon carcharias*. Photo: Jeremy Stafford-Deitsch.

Victoria is now the only state within the normal Australian range of the white shark which has still to introduce specific white shark protection measures, but it is considered likely to follow suit within the next few months.

In December, the great white shark and grey nurse (sand tiger, ragged tooth) shark were listed as Vulnerable under the Endangered Species Protection Act. The taking or killing of these species is no longer permitted in Australian Commonwealth waters (which extend from three nautical miles offshore to the edge of the continental shelf or the Australian Fishing Zone, whichever is greater). Anyone wishing to capture a great white shark or grey nurse shark in Commonwealth waters for scientific purposes must apply for a permit.

## ... US Atlantic and Gulf waters ...

As reported in the last issue of *Shark News* (9:10), a new rule for Atlantic shark fisheries implemented in April 1997 prohibited directed commercial fishing for white sharks in US federal waters (although recreational catch-and-release only fishing is still permitted).

Other species protected from all directed fishing in the Atlantic were the whale shark, basking shark, sand tiger and bigeye sand tiger.

## ... and receiving improved protection in California

A new law prohibiting the deliberate take of white sharks in Californian state waters came into force in August 1997, repealing the 1993 state law which provided temporary protection for the species. Exceptions are made for scientific and educational research and for incidental catch in selected net fisheries. The bill was sponsored by the Centre for Marine Conservation, the Point Reyes Bird Observatory, and the Pacific Coast Federation of Fishermen's Associations, and supported by over two dozen conservation, fishing, surfing and scientific organisations.

Compiled by Sarah Fowler, with thanks to several Shark Group members who provided information and updates.



## Shoals of Capricorn Programme 1997/2000

This exciting new marine research initiative was launched in 1997, the International Year of the Reef. It is a multidisciplinary research project headed by the UK Royal Society and the Royal Geographical Society at the invitation of the governments of Mauritius and the Seychelles.

The Programme aims to carry out a detailed investigation of the marine resources of the islands, banks and shoals of the Mascarene Plateau, Indian Ocean, over the next few years. More than 100 international scientists, including large numbers of divers and participants from host nations, will collaborate over data collection, analysis and interpretation of findings to assist in conservation and marine resource planning. The key features and processes controlling the geology, oceanography, biology and archaeology of the region will be explored. Scientific objectives include inventory of marine biodiversity and investigations of bank fisheries and sustainability.

Interested parties may become involved by submitting a research proposal or contacting a discipline area leader to suggest collaborative studies. Voluntary posts overseas are also open to individuals with specific relevant skills.

For more information, please contact the Shoals of Capricorn Programme by fax: (+ 44) (0) 171 591 3031 or email: <shoals@rgs.org>

Sarah Fowler

## New Shark Group homepage address

The address of the Shark Specialist Group homepage, recently constructed by webpage editor George Burgess and his staff at the Florida Museum of Natural History, has been simplified. You can find it at <<http://www.flmnh.ufl.edu/fish/research/iucn.htm>>.

Electronic versions of former issues of *Shark News* can be viewed at this site. Shark Specialist Group members are invited to submit additional material by email to the webpage editor at <[gburgess@flmnh.ufl.edu](mailto:gburgess@flmnh.ufl.edu)> or on disks by mail to the Florida Museum of Natural History, University of Florida, Museum Road, Gainesville, FL 32611, USA. Hard copies, if only available in this format, may also be submitted and will be scanned. Authors will be duly credited. Colour photographs, figures and other graphics may be submitted electronically or as slides or prints.

## First Meeting of the Brazilian Society for Elasmobranch Study (SBEEL), July 1997

The First Meeting of the Sociedade Brasileira para o Estudo de Elasmobrânquios took place in Ilheus, State of Bahia, from July 27 to August 2, 1997. The official languages of the meeting were Portuguese, Spanish and English. There were about 70 participants from Brazil and neighbouring countries, including visiting Shark Specialist Group members Dr Samuel Gruber, Dr Jose Castro and Dr Merry Camhi from the USA, Dr Terry Walker from Australia, and Dr Roberto Menni from Argentina. Activities included workshops, panel discussions and contributed papers (oral and posters). Topics covered age determination in sharks, the conservation of elasmobranchs, international cooperation in the study and management of fisheries, behaviour, reproductive migrations, chondrichthyan communities in the south-western Atlantic Ocean, future research priorities, shark attack, and biology and fisheries.

Sergio Mattos



## The Shark Trust

The Shark Trust was established in 1997 to promote the study, management and conservation of sharks, skates and rays. It is the UK member organisation of the European Elasmobranch Association (EEA, established in 1996), all of whose member bodies share similar aims and will collaborate to achieve these in national, European and international waters.



The Trust is calling for: the management of shark, skate and ray fisheries; reduction of bycatch in other fisheries; increased research effort into their biology and ecology to support the development of management and conservation strategies; the conservation and management of areas crucial for breeding and migrating sharks and the survival of young fish; promotion of international conservation and research initiatives, including tag and release programmes; legal protection for threatened species under national legislation and international conventions (for migratory species); and increased public awareness and concern for sharks and rays. It aims to join forces with other groups concerned with chondrichthyan fish conservation issues. These include commercial fishermen, recreational sea anglers, divers, yachtsmen, and all those who want to ensure the future survival of these animals.

The Trust is a registered wildlife charity (No. 1064185). It receives grant aid from the UK conservation agencies (Scottish Natural Heritage, English Nature and Countryside Council for Wales) and from WWF-UK to support its work and that of the EEA. The Shark Trust also directly supports the EEA by providing its main secretariat. Existing individual supporters of the EEA will be asked to transfer their subscriptions to the Shark Trust or to their national member body of the EEA (if any). All are welcome to join the Trust (individual annual subscription is GB £15.00, £25.00 for a family).

The Trust was launched with a week-long exhibition, including displays on research work covering the biology and ecology of sharks and rays, held at the National Sea Life Centre in Birmingham, UK, September 1997. The first annual open meeting of the Trust is being held at the London Aquarium, UK, in April 1998 (see p. 12).

For more information, please contact the Shark Trust, 36 Kingfisher Court, Hambridge Road, Newbury, Berkshire, RG14 5SJ, UK. Fax: (+44) (0)1635 550230, email: <sharktrust@naturebureau.co.uk> or visit the web page at <http://ds.dial.pipex.com/sharktrust>

Sarah Fowler

## ICES Study Group on Elasmobranch Fishes

The ICES Study Group on Elasmobranch Fishes met in Copenhagen at the end of May 1997. It has produced a report covering aspects of the biology of deep-water sharks, the blue shark, spurdog and a case study on the population dynamics of skates and rays in the North Sea. The layout and text of three posters were presented, which will aid in the identification of skates, skate wings and deep-water sharks. The report also contains an Appendix covering recent initiatives in elasmobranch research and conservation. This report was presented at the ICES Annual Science Meeting in Baltimore, USA, in September 1997 and reported to ICES ACFM (Advisory Committee for Fisheries Management) in October. The Study Group will work by correspondence in 1998 and will present the ensuing report at the 1998 Annual Science Meeting, to be held in Lisbon, Portugal, in September of that year.

Paddy Walker



## Call for Earthwatch proposals

The Center for Field Research invites proposals for the 1998–1999 field grants funded by its affiliate Earthwatch. Earthwatch is an international, non-profit organisation dedicated to sponsoring field research and promoting public education in the sciences and humanities. Past projects have been successfully fielded in, but are not limited to, the following disciplines: animal behaviour, biodiversity, ecology, ornithology, endangered species, entomology, marine mammalogy, ichthyology, herpetology, marine ecology, and resource and wildlife management. Interdisciplinary projects are especially encouraged, as is multinational collaboration. Members of the Shark Specialist Group have successfully used Earthwatch volunteers for assistance with their research projects.

Information can be found at <http://www.earthwatch.org/cfr/cfr.html>, or you can contact The Center for Field Research, 680 Mt. Auburn Street, Watertown, MA 02272. Tel: (+1) 617 926 8200, fax: ++ 8532, email: [cfr@earthwatch.org](mailto:cfr@earthwatch.org).

## American Fisheries Society Symposium on Long-lived Marine Animals

This symposium, held during the American Fisheries Society Annual Meeting (August 1997, Monterey, California), reviewed the ecology and conservation of a range of long-lived marine animals such as sharks, sea turtles, sturgeons and groupers. These are characterised by long life spans, slow growth and late maturity; factors which make them very vulnerable to mortality caused by humans. Those which also produce only a few young, capable of high survivorship under natural conditions, or which occupy limited or sensitive critical habitats (e.g. sea turtle nesting beaches or estuarine/riverine spawning grounds), are particularly susceptible to man's activities. Species with such extreme life-history limitations need careful management if they are not to be driven to regional extinction by commercial multi-species fishing operations and other human pressures.

Objectives of the symposium included educating scientists, policy-makers and the public about the need to conserve and properly manage these and other long-lived marine animals. The meeting was also the first step towards the preparation of an American Fisheries Society position statement which will be used to influence management policies for these organisms and to increase public visibility of their special management needs.

Papers were presented by top researchers from throughout the United States, Canada and Australia. Their subjects included the status, life history, management and conservation of long-lived teleosts (including orange roughy and Pacific rockfishes), right whales, and long-lived marine molluscs; variable resilience to fishing pressure among sharks; a review of population genetics in sharks; the influence of catastrophes on the demographic trends of the endangered Hawaiian monk seal; and lessons from sea turtle headstarting programmes. Proceedings are being prepared for publication.

For more information contact American Fisheries Society, fax: (+1) 301 897 8096. Web page: <http://www.esd.ornl.gov/societies/AFS>.

From: *Fisheries Information News*, Vol 3 no. 2, July 1997.

## Erratum. Genus *Glyphis*, river sharks

The boxed information on the genus *Glyphis* which appeared on page 11 of *Shark News* no. 9, within the main article by Sarah Fowler, should have been credited to Leonard Compagno. We apologise for the omission of the author's name.

## Recent & upcoming publications

### Great white sharks: the biology of *Carcharodon carcharias*

A.P. Klimley and D.G. Ainley (Editors), 1996.

Academic Press, San Diego, California. ISBN 0-12-415030-6.

This authoritative 500+ page compendium is the definitive work on the great white shark. It contains contributions from almost 70 named authors from all over the world, many of whose papers originated from talks given at the symposium on the biology of the white shark which was held at the Bodega Marine Laboratory in California, 1993. This volume has been well worth waiting for. Detailed sections cover evolution, anatomy, physiology, behaviour, ecology and distribution, population biology and, inevitably, interaction with humans – the book concludes with a case study on white shark conservation in California.

If you are at all interested in this species, then you should get hold of a copy. I can only apologise for the length of time it has taken me to provide these details in *Shark News!*

### Collins guide to sharks and rays: the ultimate guide to underwater predators

Consultant editor Leighton R. Taylor. 1997.

Collins publishers, UK. ISBN 0 00 220104 6.

I was very disappointed not to receive a copy of this book for Christmas, and have not been able to obtain a review elsewhere in time to print! However, a quick look on the bookshop shelves and reports from several readers indicate that this publication provides an excellent popular account of all major families of sharks and rays, backed by numerous colour photographs. The biology, evolution and habitats of sharks and rays are also covered. Since Father Christmas ignored my request, I will be heading off to the bookshop myself to obtain a copy.

### Sharks and rays of New Zealand

Geoffrey Cox and Malcolm Francis, 1997.

Canterbury University Press, New Zealand. ISBN 0-908812-60-4.

This guide introduces and describes all 95 of New Zealand's sharks, rays and chimaeras, their evolution, behaviour and biology. It also covers commercial and sports fishing (human attacks!), shark attacks, sharks in history and in Maori and Pacific myths, and conservation. The 68 page book is well-illustrated with numerous watercolours of many species in their natural habitats. Copies are NZ \$25 each, plus packing and postage (dependent on destination). For more information, contact M.P. Francis by email: <m.francis@niwa.cri.nz> or fax: + (04) 386 0574.

### le Requin

Published by Favre, le Muséum d'Histoire Naturelle, Paris. 1997. ISBN 2-8289-0524-1.

Selections (in French) of writings on sharks by Aristotle, Belon and Verne, to Hemingway, Benchley and Bernard Séret, chosen and introduced by Pascal Deynat. For more information contact Pascal Deynat by fax: + (33) 1 4541 1763.

### Ichthyological books

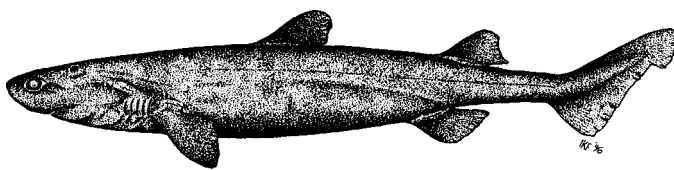
The specialist ichthyological bookseller and distributor, Steven Simpson, has moved. His new address is: Steven Simpson Natural History Books, Rising Sun, Kelsale, Saxmundham, IP17 2QY, England. Fax: (+ 44) (0)1728 604555. Tel: (+ 44) (0)1728 604777.

### Is deepwater a dead-end?

This is the title of a Greenpeace UK publication released in June 1997. Subtitled *A policy review of the gold rush for 'ancient deepwater' fish in the Atlantic Frontier*, the report summarises the current state of knowledge of the biology of deepwater fish species and growing exploitation pressures on the deepwater stocks of the North Atlantic.

It explains that scientific knowledge of the biology of deepwater species is so limited that stock depletion can take place long before the data needed for fisheries management purposes become available. However, as for elasmobranchs, our current knowledge of these species is sufficient to demonstrate that they have a very different biology to traditional commercial teleost fishes.

Deepwater species of teleosts are characterised by slow growth, longevity and low reproductive capacity in comparison with coastal species (although they are not as strongly K-selected as elasmobranchs). As a result, their stocks will take a long time to recover when removed by a fishery. The report suggests that the impacts of fishing these deep sea populations may even effectively be irreversible.



Kite fin shark *Dalatias licha* (Bonnaterre, 1788). This deepwater dogfish has traditionally been targeted by deep-water directed fisheries, which rapidly decline when large quantities are taken. With the development of multi-species deep sea fisheries, stocks of this species are likely to come under increased pressure.



Illustration: © Ian K. Fergusson.

Deepwater trawling is associated with extremely high levels of discard of non-commercial species, which will similarly be affected. Deepwater long-lining leads to a high mortality of deepwater sharks, which are even more vulnerable to the effects of exploitation than deepwater teleosts. Many of the smaller sharks are discarded, often unrecorded, sometimes after the removal of their oil-rich livers, and many species cannot be identified by fishermen or even many fisheries biologists. The report notes that these fisheries are completely unregulated. Indeed, it suggests that they provide a welcome outlet for the excess fishing capacity in the shallower water fisheries.

The final report to the UK Government of The House of Lords Select Committee on Science and Technology on the subject of Fish Stock Conservation and Management (1996) concluded: "Ideally, we would recommend an interim suspension of all deep-sea fishing, but we recognise that it could not at present be enforced." It seems unlikely that the European Commission will address this issue or adopt regulatory measures for deepsea fisheries in the foreseeable future. Greenpeace therefore advocates that the UK government should take unilateral measures to close deepwater fisheries within the area of the Atlantic Frontier which lies within its Exclusive Economic Zone.

Greenpeace UK, Canonbury Villas, London N1 2PN, fax: +44 (0)171 865 8200, and website: <<http://www.greenpeace.org.uk>>

### Song for the Blue Ocean. Carl Safina, 1997.

Shark Specialist Group member Carl Safina's new book is being published by Henry Holt Co. and will be available by the time this issue of *Shark News* is circulated (ISBN 0-8050-4671-2). Advance reviews of his account of the plight of our oceans, its fisheries and the people who rely on them are impressive. To place a credit card order call Holt at + 1-800-288-2131, or contact your bookstore.

Sarah Fowler

## TRAFFIC Regional Trade Reviews

Two new TRAFFIC Network Trade Reviews, which formerly appeared in Volume 1 of the Compendium of TRAFFIC's Regional Studies on the World Trade in Sharks (1996), have now been published separately.

*The trade in sharks and shark products in the Western Indian and Southeast Atlantic Oceans.* Editors Nina T. Marshall and Rob Barnett (1997). Published by TRAFFIC East/Southern Africa, Nairobi, Kenya.

This well-presented and informative 130-page report contains an overview chapter for the whole region, and separate accounts of reviews carried out of fisheries and trade in the Seychelles, Eritrea, the Somali shark fishery in the Gulf of Aden and Western Indian Ocean, Kenyan waters, Mainland Tanzania and Zanzibar, Mozambique, South Africa, and Madagascar. The regional study commenced with a literature review and circulation of questionnaires to the recreational and commercial fishing industries, government officials, non-governmental organisations (NGOs), associations and individuals. This was followed up by short term field consultancies in a few countries, while other reports were compiled from desk studies, questionnaire returns and correspondence with government officials and NGOs. Each chapter includes sections on the historical overview, current fisheries, trade, conservation implications, regulatory/management frameworks, and ends with a section providing conclusions and recommendations. It was impossible to assess the situation in Angola, the Comoros, Djibouti, Mauritius, Namibia and Sudan.

*The trade in sharks and shark products in India: a preliminary survey.* Fahmeeda Hanfee (1997). Published by WWF-India (TRAFFIC-India). The 50 page report, including appendices, is based on a review of literature backed by survey of a number of selected east and west coast sites, including all the major ports of India. This preliminary study did not provide sufficient data for clear conclusions to be drawn, but recommendations are made for more research and data collection and new conservation and management initiatives.

Contact TRAFFIC International for details of how to obtain these reports. Fax +44 1223 277237 or email <traffic@wcmc.org.uk>

## Great white sharks. M.C. Levine, 1998.

This new childrens' book is now available from Weigl Educational Publishers (Calgary, Alta.) in their "Untamed World" series. Like other books in the series, the book combines science (biology and environment) with literature and folklore. With Dr Leonard Compagno as its consultant, it naturally provides an accurate and informative look at this fascinating shark. The conservation status of the species, threats to its survival and efforts to protect it are given detailed coverage. There is a list of suggested further reading and useful index. The publisher's web page can be viewed at <http://www.weigl.com>.

## IUCN Shark Specialist Group publications in preparation

*Implications of biology for the conservation and management of sharks.* Compiled and edited by M.Camhi and S.Fowler.

This report, produced by the Shark Specialist Group for the CITES Animals Committee meeting in September 1996, is now being revised and updated. It will be published shortly in the IUCN Species Survival Commission's Occasional Paper series. Original contributors are asked to send their amendments and updates urgently to Sarah Fowler or Merry Camhi.

*Proceedings of the Darwin seminar and workshop on elasmobranch biodiversity, conservation and management. Sabah, 7-10 July 1997.*

The proceedings of this meeting are currently in preparation. In addition to reporting on the results of the Darwin project, the volume will include overviews of world and regional fisheries and trade, reviews of the recreational importance of elasmobranchs, an assessment of the regional biodiversity of chondrichthyan fishes, reviews of national and local fisheries and markets in the Indo-Pacific/south-east Asian region, descriptions of whale shark fisheries, freshwater elasmobranch biodiversity, and management and conservation initiatives.

Information on how to obtain copies of both these reports will be given in the next *Shark News*, or contact Sarah Fowler for details.



## 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).

I would like to continue to receive *Shark News*:

Yes: .....

No: .....

I would be prepared to subscribe to future copies of *Shark News*:

Yes: .....

No: .....

I enclose a donation for the Shark Specialist Group: .....  
(Please state how much)

Please check here if you would like to remain anonymous: .....

Name: .....

Address: .....

.....

.....

.....

I wish to pay by Visa/MasterCard; please charge to my account.

My number is .....

Expiry date ..... Signature .....

Return to: Sarah Fowler, *Shark News* Editor, Nature Conservation Bureau, 36 Kingfisher Court, Hambridge Road, Newbury, Berkshire, RG14 5SJ, UK.  
or (with donations in US\$) to: Sonja Fordham, Center for Marine Conservation, 1725 DeSales Street NW, Washington, DC 20036, USA.

## Sponsors urgently required for printing & distribution of *Shark News*

Regular readers will know that this box has, in all former issues, contained details of our main newsletter sponsor. You will also be aware that, thanks to the generosity of many different organisations, we were able to produce three issues annually until last year. However, we ran out of major sponsors following the publication of no. 9 in June 1997. This issue (no. 10), which has been ready to go to print since December 1997, has mainly been held up because of the lack of external funds for printing and distribution costs.

We particularly apologise to those readers who, despite donating funds to the Shark Group, have had a long wait for their copy. Unfortunately, the donations we receive from a small number of individuals, while extremely helpful, are quite insufficient to cover

We gratefully acknowledge the help of the National Audubon Society with the distribution of *Shark News* and the donations for newsletter production and other work received from the following individuals and organisations: Columbus Zoo, Steven Brown, Philip Diamond, Kevin Feldheim, Jorge Kotas Santiago Montealegre, Alec Moore, US National Marine Fisheries Service, Elaine Soulanille, Litz Venturi, Christine Wilkins, and Mario Zuffa.

the full costs of the newsletter. The current print run is now 1,500, and distribution world-wide is now actually more expensive than production and printing. Recognising the demand for our newsletter we eventually took the decision to use our core funds (which are usually reserved for international meetings and unavoidable administrative costs) to prepare and post this long-overdue issue, while reducing the number of pages to 12.

We very much hope to return to a regular publication schedule and longer newsletter, but this will be dependent on sponsorship. If any reader has suggestions for sources of funds for future issues, please contact Sarah Fowler or Merry Camhi for more information (our addresses are given below).

## Meetings

### Shark Trust First Annual Conference

The London Aquarium, London, UK, 4 & 5 April 1998.

Shark Trust and European Elasmobranch Association supporters will be sent programme details. For more information, contact Sarah Fowler at the Shark Trust, 36 Kingfisher Court, Hambridge Road, Newbury, Berkshire, RG14 5SJ, UK. Email: <sharktrust@naturebureau.co.uk> Fax: (44) (0)1635 550230.

### American Elasmobranch Society 14th Annual Meeting

During the ASIH meeting, Guelph, Ontario, Canada. 16–23 July 1998. Registration deadline: 1 April.

Two symposia will be sponsored by the AES:

1) **Feeding biology of elasmobranch fishes.** Organisers Enric Cortés (email: <cortes@bio.fsu.edu>, fax: (+1) 850 235-3559) and Philip Motta (email: <motta@chuma.cas.usf.edu>, fax: (+1) 813 974-3263).

2) **The behavior and sensory biology of sharks and rays: State of the art and future direction.** A symposium in honor of Donald R. Nelson.

For more information, see web pages at <http://www.elasmo.org> or <http://www.uoguelph.ca/~ichsherp>.



### INTECOL, VII International Congress of Ecology: "New tasks for ecologists after Rio 92"

Florence, Italy. 19–25 July 1998.

Ecologists will examine relationships between human activities and the environment. For more information, see web site at <<http://www.tamnet.it/intecol.98>> or contact the INTECOL Secretariat, Lunigiana Museum of Natural History, Fortezza della Brunella, 54011 Aulla, Italy. Email: <afarina@tamnet.it> Fax: + 39 187 420727.

### Proposed European Elasmobranch Association meeting

To be held in Lisbon, Portugal, mid September 1998.

Precise details are not yet available. For more information, please contact Sarah Fowler at the Shark Trust address (above), or Paddy Walker at email: <paddy@nioz.nl>, fax: + 31 22 20 19674.

### Japanese Elasmobranch Society Symposium: Recent status of elasmobranch studies

Ocean Research Institute, University of Tokyo. 19–20 November 1998.

A Southeast Asian Shark Specialist Group regional meeting may take place after the symposium. Contact SSG Regional Vice-Chair, Dr Hajime Ishihara, fax: + 81 44 922 9369, email: <skatolog@fsinet.or.jp>, or Dr Sho Tanaka, fax: + 81 54 334 5095.

## 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 usually 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, formerly 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 Co-Chair

Sarah Fowler

The Nature Conservation Bureau Ltd, 36 Kingfisher Court, Hambridge Road, Newbury, Berkshire, RG14 5SJ, UK

Fax: (44) (0)1635 550230

email: [sarahfowler@naturebureau.co.uk](mailto:sarahfowler@naturebureau.co.uk)

Shark Specialist Group Deputy Chair

Merry Camhi

National Audubon Society, Living Oceans Program, 550 South Bay Avenue,

Islip, NY 11751, USA

Fax (1) 516 581 5268

email: [mcamhi@audubon.org](mailto:mcamhi@audubon.org)

ISSN 1361-7397

Designed and produced by the Nature Conservation Bureau Limited, 36 Kingfisher Court, Hambridge Road, Newbury, Berkshire, RG14 5SJ, UK.