Col.Vol.Sci.Pap. ICCAT, 45 (3) : 307-308 (1996)

SHARKS : A VALUABLE RESOURCE, OVEREXPLOITED ?

Séret, B.

Antenne ORSTOM, Muséum d'Histoire Naturelle, Laboratoire d'Ichtyologie générale et appliquée,
43 rue Cuvier, 75231 Paris Cedex 05, France

SUMMARY

Sharks are valuable resources, although they represent less than 2% of the world catches of marine fishes. Sharks are mainly by-catches of other fisheries, and up to now little attention has been paid to the assessments of their stocks. Because sharks are often accessory catches of tuna fisheries, an international organization such as ICCAT is in a good position to deal with pelagic shark population studies.

RESUMÉ

Les requins constituent une ressource naturelle importante, même s'ils représentent moins de 2 % des prises mondiales de poissons marins. Les requins sont principalement les sous-produits d'autres modes de pêche, et jusqu'à présent il y a eu peu d'études concernant la gestion de leurs stocks. Du fait que les requins sont souvent des prises accessoires de la pêche thonière, une organisation internationale comme l'ICCAT est en bonne position pour entreprendre des études sur les populations de requins pélagiques.

RESUMEN

Los tiburones constituyen un recurso natural importante aunque representan menos del 2% de las presas mundiales de capturas marinas. Los tiburones son principalmente los subproductos de otros modos de pesquería y hasta hoy, existen pocos estudios de la gestión de su stock. Como los tiburones son capturas secundarias de la pesquería de túnidos, una organización internacional como ICCAT está en buena posición para llevar a cabo estudios sobre las poblaciones de tiburones pelágicos.

* * *

Sharks are valuable resources : indeed they are fished for their meat (eaten fresh, salted, dried or frozen), their skin (to make luxury leather) and the oil of their liver (for cosmetology and pharmaceutical industries). Some other parts are also used : the cartilage of their skeleton (ground to powder and proposed as « anti-cancer » cure!), their teeth (in jewelery) and their fins (to prepare the « famous » shark fin soup, highly prized in Asia for their supposedly aphrodisiac property!).

There are more than 380 species of sharks. They are widely distributed in all seas, occuring from the polar regions to the tropics, and from the coastal waters to 3000 m depth: then some sharks can live in freshwater. For ages, sharks have been fished moderately and only in limited coastal areas. However, in the last two decades, they have become more popular due to a better marketing and as a result, they have been intensively fished worldwide.

The analysis of the yearbooks of fishery stastistics published by the Food and Agricultural Organization (FAO) shows a net increase in elasmobranch (sharks + rays + skates) landings : from 200.000 tons in 1947, they reached 704 000 tons in 1991; i.e. 0.7 % to 1.2 % of the total world landings. However, these statictics provide only part of the reality. Firstly, because part of the catches are not included in the FAO statistics : some countries do not provide their data and some fishery data are hardly collected. Secondly, because sharks are mainly by-catch of other fisheries and that large amounts of sharks are discarded at sea. It is estimated that the total landings (including the unreported catches) should be around a million tons and that about 350.000 tons are discarded (BONFIL, 1994). As a result, the total catches should be about 1.4 million tons, i.e. twice the official statistics and about 1.4 % of the world catches. Within these catches, sharks account for about 60% , while skates and rays account for the remaining 40%. If we consider the average individual shark weight close to 15 kg, it is more than 60 millions of sharks that are caugth every year.

Althought the global catches increase, a number of shark populations are considered overexploited (cf. fig. 1), such as large coastal sharks (great white; tiger, lemon, hammerheads, etc..). In the opposite, small coastal shark populations are considered underutilized, and their strong increase in the catches make up the decrease of other categories of sharks. There is insuffisent information to assess the status of pelagic shark populations (makos, blue, porbeagle, threshers, oceanic), however some species like blue shark (*Prionace glauca*) faces extreme pressures, and there are trends of decline of their populations in all oceans (STEVENS, 1992) . Many of these pelagic sharks are caught by the tuna fisheries, and most are discarded at sea, hence not reported in the statistics. When data are available, they are hardly usable because shark species are often mixed up in a single « sharks » category or even worse in a « various sharks and rays » category.

The management of shark fisheries has been neglected for various reasons. First of all, some features of their reproductive biology make them fragile to exploitation : they have a low fecundity rate (the most prolific produce a hundred pups), long gestation periods (from 3 to 24 months), they grow slowly, they reach their sexual maturation latetly and have a long life span. Because of these biological caracteristics, sharks have a low capacity to recover from overfishing. This situation led HOLDEN (1973, 1977) to suggest that sustainable fishery for elasmobranch fishes was not possible. Indeed, the history of shark fisheries shows a number of experiences indicating that shark fisheries are rapidely declining and often they completely collapse (e.g. : tope shark fishery in California; school shark fishery in Southern Australia; porbeagle fishery in North Western Atlantic; spiny dogfish in the North Sea) (ANDERSON, 1990; ANDERSON *et al.* 1990; TANIUCHI, 1990).

The second set of reasons for which shark fishery management has been neglected is related to the relatively low market value (in comparison with other commercial fishes) of sharks, although they are important for some people, mainly in the developping countries where they constitute a cheap source of protein. In some particular cases, sharks can be of considerable economic value : e.g. in sport and game fish activities. But in

recent years, a more and more growing demand for shark fins has induced an increasing price for this « delicatecy ». As a result, both the market and the fisheries have been stimulated. Shark fins of first garde (40 cm in length) can reach 50 US $ / kg. In this rush for «fin gold », a cruel and wasteful practice, the « finning », is commonly used by a number of fishermen all around the world. The fins (mainly the dorsal and the pectoral fins) are cut off from the shark and the body if simply discarded often still alive. The fins are often taken by the sailors and represent valuable fringe benefits for them. This economical paradox is the cause of the « tragedy of shark ». (COOK, 1990; WOLF, 1990).

Another reason is that sharks have a negative image. Indeed, by tradition, the public has no sympathy for sharks, and for a lot of people, a good shark is still a dead shark! Also for some professional fishermen, sharks are undesirable animals

For all these reasons, the research on shark populations and the management of their fisheries have been little funded. The vulnerability of this valuable resource and the present situation of their exploitation are causes of concern, hence there is an urgent need for much research both pratically and theoretically. The research should take into consideration the following main points :

- sharks have low reproductive potential
- sharks have relatively low abundance (apex predator position)
- sharks are predominantly incidental catches of other fisheries
- large amounts of sharks are discarded
- increasing demand for sharks products
- lack of accurate fishery statistics
- traditional fishery models do not fit for shark fishery assessment
- variety of species make difficult identification mainly for the tropical species
- multiplicity of gears and vessels

Because of these difficulties, it is a challenge to maintain both ecologically and economically shark fisheries, but it is worth trying. The goals are to improve the fishery statistics in collecting accurate data on yields and fishing effort and in developing new models for density-dependent species (a fishery simulation model for shark has already been proposed by WALKER (1992).

Tomorrow, could we imagine tuna cans with labels indicating « shark safe » similar to the today « dolphin safe » labels? Probably not, but we could probably change the shark status from victim to resource. The present rate of exploitation of sharks might cause their decimation and negative effects in the marine food chains can be predicted because of the complex interrelationships between predators and preys. These damages would also affect humanity. Let us promote a realistic view of interaction between man and sharks in looking for means to regulate fisheries in order to develop sustainable yields and to minimize ecological damages (COMPAGNO, 1990). For this purpose, we should consider fisheries as means to inverstigate the biodiversity : all the species of a specific fishery, including the accessory ones, should be considered for both their potential economic value and for their function in the marine ecosystem. In this scope, special attention should be paid to sharks because of their growing economic value and their position of apex predator acting as a regulator of species densities. ICCAT is in good position to collect necessary data on pelagic shark populations, and has already engaged a number of studies on accessory species, through observer programmes. The effort to obtain reliable data should be maintained. Furthermore, as far as species with large geographical distribution are concerned, international collaboration is needed for their study. Again, ICCAT constitutes a perfect support for such studies, in which fishery biologists and managers could collaborate with shark specialists in order to promote responsible fishing.

REFERENCES

ANDERSON, E.D., 1990.- Fisheries models as applied to elasmobranch fisheries. *In* : H.L. Pratt Jr., S.H. Gruber & T. Taniuchi (eds), Elasmobranchs as Living Resources : Advances in the Biology, Ecology, Systematics, and the Status of the Fisheries. *NOAA Tech. Rep. NMFS* 90 : 473-484.

ANDERSON, E.D. & K. TESHIMA, 1990.- Workshop on fisheries management. *In* : H.L. Pratt Jr., S.H. Gruber & T. Taniuchi (eds), Elasmobranchs as Living Resources : Advances in the Biology, Ecology, Systematics, and the Status of the Fisheries. *NOAA Tech. Rep. NMFS* 90 : 499-503.

BONFIL, R., 1994.- Overview of world elasmobranch fisheries. *FAO Fish. Tech. Paper*, 341 : 119 p.

COMPAGON, L.J.V., 1990.- Shark exploitation and conservation. *In* : H.L. Pratt Jr., S.H. Gruber & T. Taniuchi (eds), Elasmobranchs as Living Resources : Advances in the Biology, Ecology, Systematics, and the Status of the Fisheries. *NOAA Tech. Rep. NMFS* 90 : 391-414.

COOK, S.F., 1990.- Trends in shark fin markets : 1980, 1990 and beyond. *Chondros*, 2(1): 3-6.

FAO (Food and Agricultural Organization of the United Nations), 1993.- Yearbook of Fishery Statistics : catches and landings 1991, Vol. 72.

HOLDEN, M.J., 1973.- Are long-term sustainable fisheries for elasmobranch possible? *Rap. Procès-Verbaux Réu. CIEM*, 164 : 2360-367.

HOLDEN, M.J., 1977.- Elasmobranchs. pp. 187-215. *In* : J.A. Gulland (Ed.), Fish Population Dynamics. J. Wiley & Sons, London.

STEVENS, J.D., 1992.- Blue and Mako Shark By-catch in the Japanese Longline Fishery off South-eastern Australia. *In* : J.G. Pepperel (ed.), « Sharks : Biology and Fishries ». *Aust. J. Mar. Fresh. Res.*, 43 : 227-236.

TANIUCHI, T., 1990.- The role of Elasmobranchs in Japaneses Fisheries. *In* : H.L. Pratt Jr., S.H. Gruber & T. Taniuchi (eds), Elasmobranchs as Living Resources : Advances in the Biology, Ecology, Systematics, and the Status of the Fisheries. *NOAA Tech. Rep. NMFS* 90 : 415-426.

WALKER, T.I., 1992.- Fishery simulation model for sharks applied to the gummy shark, *Mustelus antarcticus* Günther, from southern Australian waters. *In* : J.G. Pepperel (ed.), « Sharks : Biology and Fishries ». *Aust. J. Mar. Fresh. Res.*, 43 : 195-212.

WOLF, K., 1993.- Finning and other modes of inefficient and destructives development in shark fishreis. *Chondros*, 4(3): 1-4.

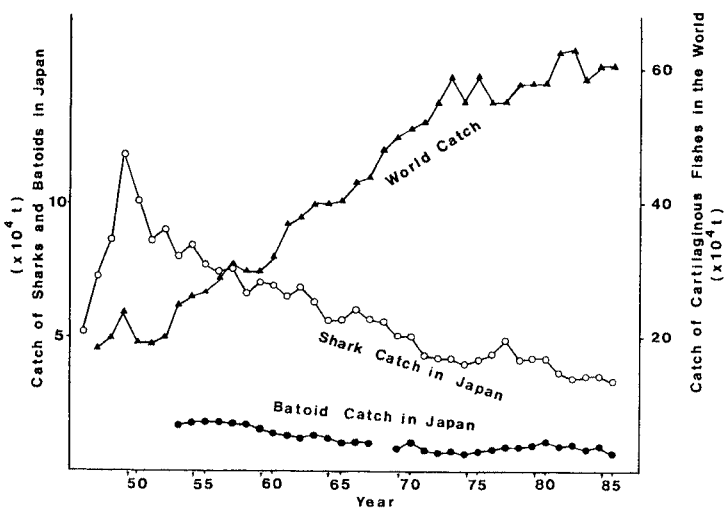

Fig 1. - This figure from TANIUCHI (1990) illustrates the evolution of the world catches of elasmobranch fishes (sharks, skates and rays) and that of the Japanese catches for sharks and batoides (skates and rays) for the period 1947-1985. The Japanese case is a good example of the present situation of elasmobranch fisheries : they are declining. However, the global world catches are increasing because the fishing effort affects other species of elasmobranch fishes, and is widespread worlwide.