TED Case Studies

Shark Case

CASE NUMBER: 62

CASE MNEMONIC: SHARK

CASE NAME: Shark Protection

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I. Identification

1. The Issue

Since 1986 demand for shark products has greatly increased as the result of a number of factors. As tuna and swordfish supplies fell, fishermen turned increasingly to sharks. For example, in Florida the shark catch doubled between 1986 and 1987. Shark meat soon became popular and increasing demand drove up prices. During the 400 million years sharks have inhabited the world's oceans they have evolved into apex predators -- they are at the top of the food chain among marine life -- but are not able to withstand predation by humans. Because of demand for shark meat and for fins used in shark's fin soup, shark have come under heavy pressure from harvesters in North American waters. Therefore, the U.S. National Marine Fisheries Service has instituted quotas on shark taking in the U.S. Exclusive Economic Zone (EEZ).

2. Description

Many sharks are now being killed. The meat of the shark itself, which can be expensive, is not the part of the animal with the greatest economic value. Half of the shark's value is in the fins which are largely sent to Asia to make shark-fin soup. The fins have noodle-like cartilaginous tissues used by Chinese chefs to thicken and flavor soup. Long strands are prized and unusually large fins can be worth more than the average $10 per pound.(1) Demand for shark's fins have risen dramatically in the People's Republic of China (PRC). Liberalization in the PRC which lifted restrictions against eating shark-fin soup, combined with increasing wealth, have fueled the increasing demand for sharks.(2) Hong Kong alone consumes an estimated 3 million kilograms of shark in a year.(3) Sharks preferred for shark-fin soup are sandbar, bull, hammerhead, blacktip, porbeagle, mako, thresher, and blue; only the lower caudal lobe from mako and thresher is considered acceptable.

Since shark meat has remained relatively low priced, fishermen are often interested in the fins only -- leading to the practice of live-finning, which is removing the fins from the shark while the shark is alive and returning the shark to the water. While some sharks may be able to swim in shallow water without fins, they sink to the bottom in deeper water. It is estimated that worldwide 100-200 million sharks per year die in the fishing/finning process, earning $240 million per year for suppliers. It is feared that some species are already near extinction. While the National Marine Fishery Service (NMFS) admits that no one truly knows how many sharks are out there, estimates from test sample areas and mathematical models suggest that the following species are already near extinction: mako, elephant fish, lemon sharks, hammerheads and great whites.

Increased fishing of sharks is of particular concern in light of their slow rate of reproduction. Shark reproductive strategy produces few adults. It takes most sharks 12 to 15 years to reach sexual maturity. Gestation periods can be as long as 22 months. The result is that once the shark population is depleted it takes decades to replace itself. In addition to their culinary appeal, sharks have both medical and ecological benefits. For example, shark corneas are transplanted into human eyes, shark cartilage is used to create artificial skin for burn victims, and shark-liver oil is used in hemorrhoidal medications.

In addition, sharks rarely develop cancer and research on sharks might lead to a better understanding of the disease. Shark cartilige, thought to cure cancer, has led to a boom in poruidct sales. One Costa Rican company reports a seven-fold increased in production of shark products such as this. Sharks help balance out the ecology in oceans. Without sharks, some prey -- for example, stingrays favored by hammerheads -- would boom. In Australia, ecologists believe that increased shark fishing may have caused the spiny lobster industry in some areas to collapse since small octopi, whose numbers are no longer kept down by sharks, prey on the lobsters.(4) Sharks also serve to remove the sick, diseased, weak or injured animals from the ocean.

Last year the United States outlawed live finning and published plans to protect 39 species of shark. Federal officials have worked for 3 years on a fisheries management plan for Atlantic and Gulf waters to protect the shark population. The plan, called the Fishery Management Plan (FMP) comes from the National Marine Fisheries Service (NMFS). Its aim is to reduce the commercial and recreational fishing through licensing requirements and quotas. The plan also bans the practice of stripping the fins from sharks and dumping the sharks back into the ocean. There have been reports that in shallower waters the sharks have attacked swimmers on occasion, as they drifted towards shores and beaches.

In addition to the efforts of the United States international cooperation will be necessary. A conference on shark conservation was held in 1992 in Sydney during which delegates agreed to recommend a ban on finning and establish quotas and fishery management plans.(5) Australia has recently banned trade in great white parts and restricted fishing for several other shark species. In addition, South Africa recently declared the great white shark a protected species and imposed a ban on fishing them and selling their jaws and other parts.

When the NMFS first produced a draft of its fisheries management plan in 1989 the fishing industry was outraged, complaining that the NMFS had in the mid-1980s encouraged fishermen to enter the business of shark fishing particularly by conducting seminars, calling sharks an "underutilized resource" and even giving them names of Chinese people who dealt in fins.(6) Since then, there has been a realization that stocks are becoming endangered and some management is required.

3. Related Cases

SALMON case

LUMMI case

SHRIMP case

SQUID case

GILLNET case

DONUT case

TURBOT case

PACTUNA case

SEACUKE case

SEAHORSE case

DRIFTJAP case

SEAHORSE case

Keyword Clusters

(1): Trade Product = MEAT

(2): Bio-geography = OCEAN

(3): Environmental Problem = Species Loss Sea [SPLS]

4. Draft Author: Jeannine MacKay

II. Legal Clusters

5. Discourse and Status: AGReement and COMPlete

Since many species of sharks migrate beyond U.S. waters and are fished by other nations, for example Cuba and Mexico, cooperation with these nations will be necessary to establish a comprehensive plan for shark protection. Cooperation with Mexico can proceed under existing agreements such as the MEXUS- Gulf agreement and the International Convention for the

6. Forum and Scope: USA and UNILATeral

There are three parts to the shark protection regulations. (1) Quotas: The large coastal and pelagic species (those living in the open sea) each have semi-annual quotas (January 1-June 30, July 1-December 30). Once the quota for that time period is reached, the commercial fishery for that species group is closed. The annual quota for the large coastal species group (this is the group targeted by the FMP) for 1993 has been set at 2,436 million tons by dressed weight. The quota for pelagic species which are primarily taken as by-catch in tuna and swordfish fisheries has been set at 580 million tons. Currently there are no restrictions on commercial fishing of the small coastal species. The recreational "bag limit" aims to keep landings of large coastal sharks below 464 metric tons (mt) and of pelagic sharks below 980 mt. Therefore, the bag limit is 4 sharks per boat per trip for large and pelagic species combined. The limit is 5 sharks per person for small coastal shark species. (2) Licensing: All fishermen who catch and sell shark meat or fins from the U.S. EEZ are required to purchase an annual federal permit. The recipient of the permit must agree to abide by federal shark fishing regulations whether in state, federal or international waters. The recipient of the permit must also earn over 50 percent earned income from commercial fishing, or from charter vessel or headboat operations or have at least $20,000 in gross receipts from selling fish.

(3) Ban on finning:

The practice of live finning is banned and the landing of fins and carcasses must be at a weight ratio (fins to carcasses) equal to or less than 5 percent. Regulation of shark fishing in the U.S. Exclusive Economic Zone (EEZ) occurs at the federal government level. Several nations have a Governing International Fishery Agreement (GIFA) with the United States but none of the GIFAs involve sharks; sharks are a prohibited species and foreign vessels cannot fish them with the EEZ. Mexico, the Bahamas, Canada, and Cuba also have economic/conservation zones which exclude foreign fishermen. Australia and South Africa have each recently imposed bans on fishing of great white sharks and have restricted fishing of other shark species.(8)

Related U.S. Federal Laws include:

1. Magnuson Fishery Conservation and Management Act of 1976 as amended: 16 U.S.C. 1801-1882

2. Atlantic Tunas Convention Act (ATCA) as amended: 16 U.S.C. 971 et seq.

3. Marine Protection Research, and Sanctuaries Act of 1972 (MPRSA), Title III as Amended: 16 U.S.C. 1431-1445

4. Clean Water Act (CWA) as Amended: 33 U.S.C. 1251 et seq.

5. Marine Protection, Research, and Sanctuaries Act (MPRSA), Title 1 as Amended: 33 U.S.C. 1401-1421.

6. Coastal Zone Management Act of 1972, as Amended (CZMA): 16 U.S.C. 1451-1464

7. Endangered Species Act of 1973, as Amended: 16 U.S.C. 1531-1543

8. National Environmental Policy Act (NEPA), as Amended: 42 U.S.C. 4321-4370a

9. Fish and Wildlife Coordination Act, as Amended: 16 U.S.C. 661-666c

10. Fish Restoration and Management Projects Act, as Amended: 16 U.S.C. 777-7771

11. National Park Service Organic Act, as Amended: 16 U.S.C. 1-4, 22, 43

12. Lacey Act, as Amended: 16 U.S.C. 1540,3371-3378

13. Marine Mammal Protection Act of 1972, as Amended 16 U.S.C. 1361-1407 (9)

Proposed rules from the NMFS in February, 1997 would tighten the regulations on shark taking, in light of the dorp of shark poluations of as much as 80 percent in some parts of the Atlantic. For most species, taking swould be reduced by 50 pcerent and for five species harvesting would be completely banned. (10) 7. Decision Breadth: 3 (USA, China, Taiwan) The measure of course will affect the United States, along with the chief consuming nations, China, Hong Kong and Taiwan.

7. Decision Breadth

8. Legal Standing:

LAW

The Magnuson Fishery Conservation and Management Act, in Section 304(c), gives the Secretary of Commerce authority to prepare and implement a fishery management plan for any fishery which requires management, including migratory species such as oceanic sharks (see SALMON case).

C. GEOGRAPHIC Clusters

9. Geographic Locations

a. Geographic Domain : North America [NAMER]

b. Geographic Site : CARIBbean

c. Geographic Impact : USA

Shark fishing has become focused on North America because it contains one of the world's last great reserves of sharks, mostly because Americans have never had a tradition of shark eating. "With the Arabian Sean and Nigerian and Mexican waters all but fished out, suppliers are turning to the U.S. market just for the fins, which can bring more than $20 a pound for shark-fin soup."(11)

10. Sub-National Factors: NO

In all, 18 countries border the Atlantic Ocean and the Gulf of Mexico and Puerto Rico and the U.S. Virgin Islands border the Caribbean. Each has its own management authority over fishing of sharks in state/provincial waters. Florida, North Carolina, Texas and Virginia are the only states among this group which have specific regulations concerning shark fishing in state waters. States will be encouraged by the NMFS to comply with Fishery Management Plan regulations.

11. Type of Habitat: OCEAN

D. TRADE Clusters

12. Type of Measure: Regulatory Standard [REGSTD]

13. Direct vs. Indirect Impacts: INDirect

The measure does not ban the trade of shark, but puts limits on the taking of shark for any purpose.

14. Relation of Measure to Environmental Impact

a. Directly Related : YES SHARK

b. Indirectly Related : YES SHARK products

c. Not Related : NO

d. Process Related : YES Species Loss Sea [SPLS]

15. Trade Product Identification: MEAT The meat, oil, nad hides of sharks.

16. Economic Data

The economic significance of shark fishing quotas is that sharks have traditionally been looked upon as an underutilized resource. Fishermen with the encouragement of the NMFS turned to shark fishing when swordfish and scallops became too expensive. Shark meat in the United States was a low-priced alternative. The NMFS estimates cost/benefits of the FMP as follows: process of developing, implementing and maintaining the FMP for the government sector totaled $1,704,600 and for the private sector $154,302. The annual effect on the U.S. economy by the FMP is not likely to equal $100 million. The Shark FMP is not expected to cause a major increase in costs or prices for consumers, individual industries, or local government agencies. The FMP is not expected to adversely affect competition, employment, investment or productivity (see Table 1).(12)

Table 1

Average Nominal Dollar U.S. Commercial Shark Values by Region 1979-1990 (per kilogram) New Eng. Mid-Atlan. S. Atlantic Gulf/Mexico Total 1979 .56 .45 .50 .33 .44 1980 .22 .31 .47 .88 .50 1981 .23 .25 .95 .84 .64 1982 .54 1.15 .71 .89 .80 1983 1.38 1.30 .84 1.00 .99 1984 1.27 1.69 .85 .88 .94 1985 1.66 1.77 1.09 .90 1.10 1986 2.05 2.44 1.03 .95 1.14 1987 2.17 2.58 1.08 1.03 1.17 1988 1.94 1.85 1.05 1.05 1.10 1989 1.94 1.85 1.04 1.06 1.10 1990 1.65 1.97 1.04 1.07 1.10

Source: Fishery Management Plan For Sharks of the Atlantic Ocean. Prepared by National Marine Fisheries Service, National Oceanic and Atmospheric Administration of the U.S. Department. of Commerce, February 25, 1993. (Published April 26, 1993.) 17. Impact of Measure on Trade Competitiveness: MEDIUM The regulations on shark fishing are not in the form of export/import bans, etc. The extent to which they affect trade will be determined by the extent to which supply is reduced. Some in the U.S. shark fishery industry argue that it is impossible to regulate the migration of sharks and that since Mexico's shark fishery is double the size of the U.S. stock, the Fishery Management Plan policies will only penalize the U.S. shark fishery. The NMFS estimates that the Shark FMP will not interfere with U.S. shark fisheries' ability to compete with foreign fisheries in domestic or export markets.

18. Industry Sector: FOOD

19. Exporter and Importer: USA and CHINA

Information on international shark trade is limited, but it is estimated that world trade of shark products equals $240 million.(13) True numbers are unknown because markets operate with the secrecy of black markets and in addition the U.S. Commerce Department lumps sharks in with all species of fish in trade statistics.(14) The leading exporters include Hong Kong, Japan, China, Mexico, and the United States, the latter importing $6 million in 1990. The leading regional importer of dried shark is east Asia ($133 million in 1989). The leading country importers were Hong Kong ($5.8 million in 1989), the EEC ($75-127 million in 1989) and the United States ($5.8 million 1990). Perhaps some of the U.S. imports were consumed by Americans of Asian heritage.

E. ENVIRONMENT Clusters

20. Environmental Problem Type: Species Loss Sea [SPLS]

21. Name, Type, and Diversity of Species

Name: Shark

Type: Animal/Vertibrate/Cartilaginous

Diversity: Sustainable yield of 4,300,000 metric tons/year (Western Central Atlantic)

Sharks' habitat includes estuaries, near shore areas, the continental shelf, the continental slope, and open ocean. Many species of shark are migratory. Of the world's 350 species of shark, 39 are directly targeted by the Fishery Management Plan: o Large Coastal (the 22 species include sandbar, blacktip, dusky, spinner, silky, bull, big nose, narrow tooth, galapagos, caribbean reef, tiger, sand tiger, big eye sand tiger, lemon, night, nurse, great hammerhead, smooth hammerhead, scalloped hammerhead, whale, basking and white); o Small Coastal (the 7 species include atlantic sharp nose, caribbean sharp nose,

bonnet head, black nose, small tail, fine tooth and atlantic angel); and o Pelagic (the 10 species include short fin mako, long fin mako, thresher, big eye thresher, oceanic white tip, porbeagle, blue, seven gill, six gill and big eye six gill).

Thirty-four additional species will be monitored for data collection only; these are generally small, deep water sharks caught in swordfish and tuna long line fishing. 22. Impact and Effect: MEDium and PRODuct The shark is the apex predator of the world's oceans. If the shark population is decimated the marine food chain will have to adjust: sting rays and octopi will grow in numbers and their prey will decrease in number (as noted, octopi feed on lobster). 23. Urgency and Lifetime: MEDium and 20-60 years

No one knows for sure the numbers of sharks in the world's oceans. Sampling indicates the following species may already be near extinction: mako, elephant fish, lemon, hammerhead, great white. Shark lifetimes depend on the species. For example, the life spans of the species deemed by the NMFS as the 2 most important species differ by 40 years; the estimated life span of the blacktip shark is 21 years while that of the sandbar is 60 years.

24. Substitutes: LIKE

Other fish or differing types of sharks may be substitutes for the shark now being caught. Shark farming might be a possible alternative, but it could be a dangerous business. Sharks were valued earlier in the century because they are a good source of vitamin-A. However, scientists have since then found a way to synthesize vitamin-A. Sharks are still sought for their meat which was a cheaper alternative to other fishes, their leathery skin and their fins. Fins make up the majority of international shark trade.

VI. OTHER Factors

25. Culture: YES

Chinese have been using shark fins for soup since the Han Dynasty over 2,200 year ago.(15) It will be difficult to change their cultural practices and their beliefs in the special curative properties in shark's fin soup (see also SWIFT case). Many, however, argue that shark is an expensive source of protein with few medicinal properties. The shark's reputation as a man eater, particularly since the "Jaws" movies has made shark fishing a popular sport, also contributes to its decline.

26. Trans-Border: YES

This case has involved cooperation between the United States and Mexico in the Caribbean.

27. Rights: YES

The practice of finning has been criticized as unnecessarily cruel to sharks, leading to sure death.

28. Relevant Literature

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