

C.C: ALR/TQ | MR/KJ/AZ | GNJ/JA

~~Jan~~ 30/11 AMK/SJ → Units

This is the first time that we have a status report on marine turtles in Pakistan. PRG members to please review & return with comments to the

PD/Step

Literature overview

SHRIMP – MARINE TURTLE Interaction in Pakistan



Step
This is excellent. We will review it internally, and use this as our concept paper/proposal for a survey. Good work!
Please add a budget for the survey. Discuss with TQ and myself. I will take this forward with IWCN US office to explore US funding.

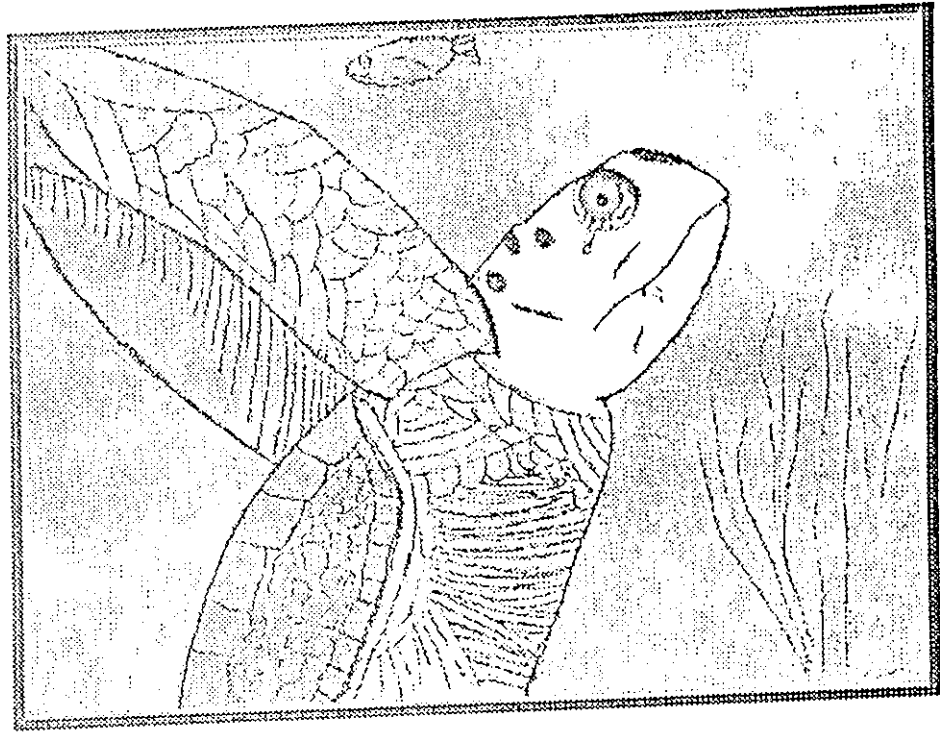
Nick
27/11

DRAFT
November 1998
Stef Stevens

Pakistan ...
Step

Literature overview

SHRIMP -- MARINE TURTLE Interaction in Pakistan



Marine turtles in Pakistan

Introduction

Marine turtles spend almost their entire life-cycle out at sea, where they prey upon slow drifting marine organisms such as jelly fish, scavenge on dead benthic animals, or feed on macro algae. Mature turtles mate in the open ocean. Female turtles need to come ashore to lay eggs this is accomplished by constructing a sand pit in the soft sediment close to the high water line. Only a limited number of beaches are suitable nesting sites for marine turtles. During the incubation period the eggs develop and hatch after 6 to 8 weeks. After emerging at the beach-surface turtle hatchlings crawl to the shoreline to enter their marine habitat. The mortality during this journey is high. Females which make it to maturity after approximately 15 years and which get impregnated will try to make to the same beach where it hatched to lay her eggs. Only 0.1 to 0.2% of the hatchlings survive to reach maturity.

Pakistan

The green turtle (*Chelonia mydas*), olive ridley turtle (*Lepidochelys olivacea*) and possibly the hawksbill turtle (*Eretmochelys imbricata*) inhabit Pakistan coastal waters. Hawkesbay and Sandspit beaches in the province of Sindh are internationally recognized nesting habitats of marine turtles. Although less documented the Balochistan province also has a number of nesting sites for turtles. Literature sources report nesting sites at Jiwani, Astola Island and the Sonmiani area. Unpublished reports from 1975 suggest that mass nesting occurs in the Omara area. A preliminary survey in January 1987 confirmed that large number of green turtles nest on beaches near the four main towns of Balochistan (Groombridge et al, 1987)

In October 1979 a turtle conservation/research project was started on the beaches of Hawkesbay and Sandspit under the authority of WWF. Later this project was taken over by the Government of Sindh. On these beaches legal protection of turtles was implemented and a hatchery programme was set up. Eggs from endangered nests were transferred to protected enclosures and hatchlings were released near the shoreline.

In 1984 Kabraji and Firdous estimated that roughly 6000 green turtles nest on Hawkesbay and Sandspit beaches each year and between 24,000 and 36,000 green turtles live in Pakistan's coastal waters. Groombridge and Luxmoore (1989) suggest that the total number of green turtle females, which nest each year on these beaches, may be lower: 2000-3000. Nevertheless, combined with the suspected numbers of green turtles nesting at the Balochistan sites make Pakistan one of the world's more important nesting areas.

The number of olive ridley turtles nesting at the 'research' beaches were estimated at approximately 200 per year, the amount of olive ridley turtles inhabiting the coastal waters is estimated to number between 800 and 1200 (Kabraji and Firdous, 1984)

From October 1979 till December 1996 almost 1.5 million green turtle and 77,000 olive ridley turtle eggs were protected on the projects' beaches. During this period 359,000 green turtle hatchlings and 21,000 olive ridley hatchlings, emerging from the enclosures, were released to the sea (Fehmida F Asrar, 1996)

Marine Turtle Mortality

Mortality of marine turtles at sea is caused by a number of factors: natural causes of death are predation by (tiger)sharks, old age, disease or parasites and collision with rocks during storms. Human induced mortality comprises of turtle hunting (for meat, shell, bone, oil and leather), pollution induced diseases (chemical or biological contamination), pollution induced suffocation (plastic bags etc), turtle-boat collisions and fisheries mortality.

Literature on mortality

- Japanese Customs statistics indicate that in 1985 2925 kilo of turtle skins were imported from Pakistan, the value of these imports are estimated at 3044,000 Japanese Yen. It is not known what turtle species this refers to, but Green turtle skin was probably also included (B. Groombridge and Luxmoore, 1989)

Fisheries mortality:

- Although fishing activities are not directly associated with turtle harvesting, they can have significant adverse effects through incidental entanglement and entrapment gear such as trawls, set nets, pound nets and gill nets. In the United States, an estimated 432 green turtles per year are caught in shrimp trawls with an estimated mortality of 97 (Bacon et al, 1984). Trawling activities also reportedly cause significant mortalities off the Pacific coast of Panama, the Western Mediterranean (possibly 1,000 per year), Colombia, Honduras, Australia, Ecuador, Peru, the Guianas and Pacific Central America (Groombridge, 1982). Turtles are also incidentally taken in net fisheries, trap fisheries and by hook and line (Crouse, 1982). Hatchlings attracted to deck lights may suffer significant mortality through enhanced predation. Green turtles are also affected by fishing methods using dynamite and chlorine bleach. Miscellaneous impacts of fishing-related activities include ingesting and entanglement in litter such as styrofoam, plastic, line and discarded netting (Andreas Mager, 1985).
- Incidental capture of turtles during other fishing activities is possibly the major form of direct mortality. Hillstead et al (1982) reviewed incidental catch and concluded that shrimp trawling posed the major threat, probably because it is usually carried out in shallow, warm seas which are also the feeding areas used by most sea turtle species (Groombridge and Luxmoore, 1989).
- Todd Steine, Director from the Sea Turtle Restoration Project, estimates that at least 124,000 marine turtles may be captured and killed every year in the nets of foreign shrimp boats (Spring 1996)
- (January 1998): Marine Turtle Newsletter (Number 79). The average number of females nesting on the Gahirmatha beach in Orissa, India used to be 200,000 to 600,000 individuals. In 1997 the mass nesting of olive ridley turtles (*Lepidochelys olivacea*) did not take place on this beach. One explanation for this is offshore fishing. Although between October and April the fishing is prohibited within 20 km of the coast hundreds of trawlers and gill-netters are observed operating in the area. Thousands of dead turtles washed up on the beach, which were presumably drowned in the nets of the fishermen.

Pakistan shrimp fisheries

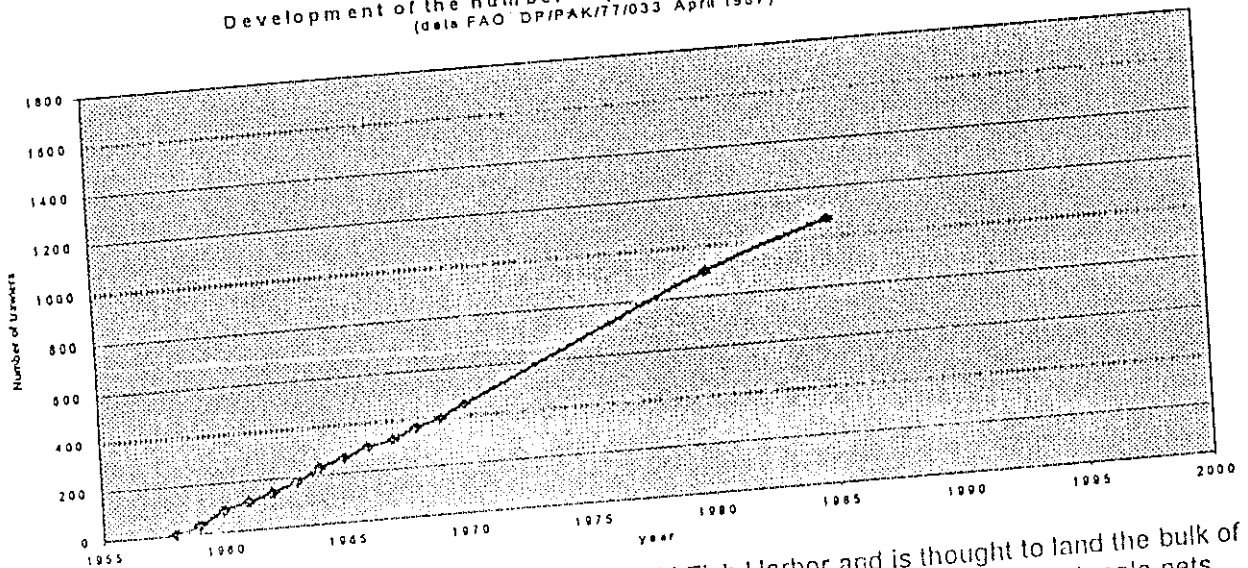
Introduction

Pakistan's most important fishery is that for shrimp because of its high foreign exchange earnings (over 100 million US dollar in 1997 (source Marine Fisheries Department, 1998)) and employment which it generates

Commercial shrimp trawling started in 1958, after the Central Fisheries Department, on recommendation from the FAO, introduced mechanization of larger fishing crafts in 1956 (Qureshi, 1961 and Jaleel 1978) The trawler fleet rapidly expanded from three vessels in operation in 1958 to 1070 in 1985 (see figure 1).

Figure 1:

Development of the number of (shrimp) trawlers in Pakistan
(data FAO DP/PAK/77/033 April 1987)



The trawler fleet is almost entirely based in the Karachi Fish Harbor and is thought to land the bulk of the shrimp catches. The rest of the landings is done with other gears such as castnets, tangle nets, barrier traps etc, these gears continue to be used to catch shrimp, particularly in the coastal areas of Balochistan and in the creeks of the Indus Delta. According to the Marine Fisheries Department (1998) more than 97% of the shrimps were landed in Sindh in 1997. See appendix A for details on typical trawl gear used in Pakistan

The fishery assessment made by the FAO in 1973 recommended limiting the shrimp trawler fleet size to the number then reached (450 trawlers). However the Government did not take any measures to limit the growth of the number of trawlers. In 1983 the Pakistani Government imposed a ban on shrimp fishing in June and July

No fisheries sector study has been conducted since 1987, therefore there is no information on the number of shrimp trawlers fishing in Pakistan's waters at present. But since the Government didn't restrict the issue of new fishing licenses the trawling fleet is believed to have expanded significantly. This assumption is affirmed by recent data from Balochistan (Directorate of Fisheries Balochistan, 1998) which indicate that the total number of motorized fishing boats (including shrimp trawlers) increased from 2294 in 1986 to 3854 in 1995

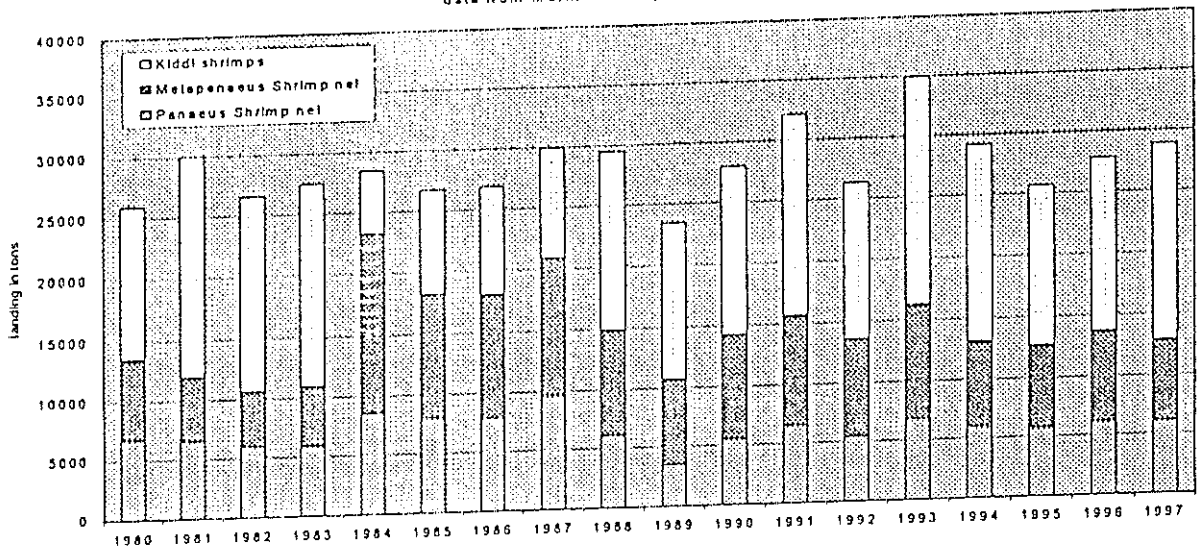
By-catch is discarded unless storage capacity is sufficient or 'trash-fish' carrier boats are available which buy the accumulated 'trash' fish from the shrimp trawlers for the fish-meal plants which serve the poultry industry. The quantity of by-catch is estimated to be 4-5 kg of fish per 1 kg of shrimp

In Pakistan's shrimp fisheries three groups of shrimp are distinguished in regard to market value:

1. *Panaeus* shrimp, the most valuable group of species (21% of the total catch in 1997)
2. *Metapenaeus* shrimp, the second most valuable group of species (24% of the total catch in 1997)
3. Kiddi shrimp the least valuable group of species (55% of the total catch in 1997)

The Maximum Sustainable Yield (MSY-the maximum amount which can be caught in one year without the fishery-mortality exceeding the natural recruitment) is estimated at 28.000 tons (van Zalinge (1973)?). The annual shrimp catch has been fluctuating since 1980 between 25.000 and 30.000 tons. Figure 2 shows the annual shrimp landings in Pakistan from 1980 and 1997.

Annual shrimp landings in Pakistan in 1980-1997
data from Marine Fishery Department Pakistan



Threat to Pakistan's Shrimp Export:

In the last years a two mayor threats for the export of shrimp from Pakistan to Western countries evolved

In spring 1998 European Union banned all fish and shellfish products from Pakistan, due to the unhygienic conditions in the Karachi fish harbor. After a major renovation organization, financed by the European Union, fish/shellfish products were in the fall of 1998 allowed to be exported to the EU again. The latest developments are that the EU is still concerned about the hygiene situation in the Karachi harbor. Pakistan is given three months (?) to comply with the European Hygienic Standards for Fish products or a new ban will be imposed.

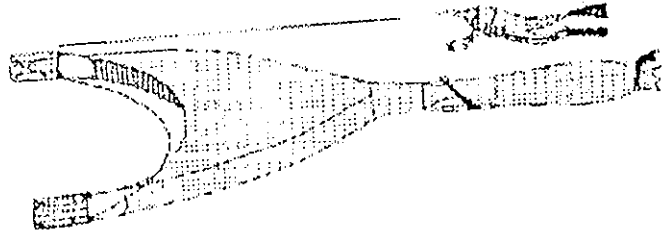
In December 1995 the United States Court of International Trade (CIT) rules that import ban must be applied to all 'shrimp and shrimp products *wherever harvested in the wild*' by mechanised trawlers without Turtle Excluder Devices (TEDs) operating in waters where marine turtles occur. This resulted in May 1996 in a ban on the export to the United States of shrimp caught in Pakistan, since marine turtles occur in Pakistan's waters and all Pakistani trawlers fish without the use of TEDs

Turtle Excluder Devices

In order to prevent marine turtles which are accidentally caught in shrimp trawl-nets, from drowning the United States based National Marine Fisheries Service (NMFS) developed Turtle Excluder Devices (TEDs).

The Turtle Excluder Device or TED is a grid of bars with an opening either at the top or the bottom. The grid is fitted into the neck of a shrimp trawl. Small animals like shrimp slip through the bars and are caught in the bag end of the trawl. Large animals such as turtles and sharks, when caught at the mouth of the trawl, strike the grid bars and are ejected through the opening.

Data show that TEDs are effective at excluding up to 97% of sea turtles with minimal loss of shrimp. The use of TEDs allow shrimpers to continue fishing without harming the sea turtle population



This resulted in an appeal by affected countries with the World Trade Organization. See appendix B for the chronology of this conflict. In the summer from 1996 shrimp exports to the United States were resumed pending the appeal and because Pakistan claimed that the types of trawls used in Pakistan do not threaten the turtle population. However this claim has not been based on substantial research.

Summary Literature on incidental catch of marine turtles in Pakistan

(19 June 1996): Report from Pakistani survey team from Sindh Wildlife Department is submitted. 'Survey of marine Turtles in the coastal areas of Balochistan': It concludes that Pakistan shrimp fisheries consist primarily of manual fishing methods and therefore is unlikely to entrap marine turtles. In addition, foreign trawlers are banned in Balochistan coastal waters.

(21 September 1997) Article from Fehmida Firdous Asrar (Sindh Wildlife Department): 'Carcasses of Green and Olive Ridley turtle regularly litter the beaches on the southern coast. Caused by drowning in the nets used for shrimp fishing.'

- (November 1998) Publication of M. Moazzam (MFD): Turtle entrapment and shrimp fisheries in Pakistan: Pakistan's shrimp fishery doesn't contribute to the mortality of marine turtles:
- Pakistan's shrimp trawlers use small nets and trawl at a very slow speed
 - The habitat of major 'shrimping' grounds is not suitable for marine turtles
 - The locations of 'shrimping' grounds and turtle habitats don't coincide in Pakistan
 - Marine turtles are sacred animals for Pakistani fishermen and therefore immediately released if entangled
 - Studies on by-catch reported not a single case of entrapment of marine turtles
 - Sindh Wildlife Department indicates that population of turtles is stable and turtle nesting is increasing
 - No turtle carcasses are found on beaches during 'shrimping' and in 'shrimping' areas during the peak shrimp season

Discussion and recommendations:

It is unclear if incidental catch by shrimp trawlers significantly contributes to the mortality of marine turtles in Pakistan waters. The limited amount of publications on this issue are contradicting each other.

No reliable surveys have been done to estimate the mortality of marine turtles in Pakistan coastal waters. No data could be found on the amount of carcasses of Green and Olive Ridley turtles found on the beaches of Sindh and Balochistan. However to determine the fisheries induced mortality counting carcasses on the beaches will not be sufficient since most causes of death leave no specific trace. In-depth research to determine post-mortem (chemical analyses, carcass anatomy) will be necessary in most cases to determine the exact cause of death.

Although the report of Mr. M. Moazzam from MFD (previous page) draws some plausible conclusions, further research is necessary to verify these arguments. Since the stakes in the shrimp business are very high, because of the enormous revenues, an independent party should carry out a well-planned representative survey to estimate the real fishery-induced mortality of marine turtles. Such a survey should cover a time span of at least one year and the circumstances should be created so the research teams safety is guaranteed and that they can work unrestricted. This research should include regular checks of beaches for turtle carcasses, postmortem on carcasses and observers on trawlers to observe fishing practices and record incidental catches.

Other steps, which should be taken, are a survey by the Marine Fisheries Department to assess and update the exact number of commercial shrimp trawlers, type of gear they use and location and duration of fishing. This survey should be conducted with an objective and reproducible set-up.

Depending on the outcome of these surveys an implementation program of TEDs should be developed. Including awareness raising, solving financial constraints and preferably producing TEDs locally. A monitoring program is needed in order to keep track of effectiveness of the implementation of TEDs.

Literature

- Aban Marker Kabraji, Fehmida Firdous, 1984: Conservation of turtles Hawkesbay and Sandspit, Pakistan, World Wildlife Fund and Sindh Wildlife Management Board, Karachi, March 1984.
- Andreas Mager, 1985: Five-year Status Reviews of Sea Turtles Listed Under the Endangered Species Act of 1973, NOAA, National Marine Fisheries Service, January 1985.
- B Groombridge and R Luxmoore, 1989: The green turtle and hawksbill world status, exploitation and trade, IUCN Conservation Monitoring Centre, SITES, 1989
- Fehmida F. Asrar, 1997: Research and conservation of marine Turtles, Progress report upto December 1996, Karachi
- IUCN 1996, Report on the Green Turtles of the Balochistan Coast, IUCN, Karachi, 6 December 1996
- M. Moazzam, 1998: Turtle entrapment and shrimp fisheries in Pakistan. Marine Fisheries department, Government of Pakistan, Karachi.
- Marine Turtle Newsletter 1996, Sea World Research Institute, Number 73 April 1996
- Marine Turtle Newsletter 1998, Marine Turtle Research Group, Number 79 January 1998
- WWF 1997, WWF Amicus Brief to WTO Shrimp-Turtle Dispute, WWF-Legal Brief, September 1997, Gland Switzerland

History of the shrimp turtle ban globally and in Pakistan in chronological order

Global Shrimp-Turtle Interactions Events

Date	Event	Date	Shrimp-Turtle Interaction Events in Pakistan
24 Feb 1992	The Earth Island Institute, a San Francisco-based environmental organization, filed a suit on to force the Departments of State and Commerce to comply with the Federal law requiring the ban of shrimp imports from countries who endanger sea turtles through shrimp fishing.		
1 Dec 1994	United States requires its domestic shrimp vessels to use TEDs		
Dec. 1995	Appeal to the extra-jurisdictional and unilateral application of domestic law in the US (based on Section 609 of the US Endangered Species Act).		
29 Dec 1995	US Court of International Trade (CIT) rules that import ban must be applied to all shrimp and shrimp products <i>whether harvested in the wild</i> by mechanised trawlers without TEDs operating in waters where marine turtles occur.	1 May 1996	Ban on export of non-aquaculture shrimp caught without turtle excluder devices to the United States from Pakistan.
1 May 1995	Ban on export of non-aquaculture shrimp caught without turtle excluder devices to the United States (including Pakistan).	2-9 June 1995	Ban on export of non-aquaculture shrimp caught without turtle excluder devices to the United States from Pakistan. Pakistani survey team investigates occurrence of accidental marine turtle catch in shrimp fishing nets in Pakistan (Keti Bundar, Rehri, Ibrahim Halderi, Cape Monze, Sonmiani, Ormara, Pasi, Gwadar, Jewani).
		19 June 1996	Report from Pakistani survey team is submitted. 'Survey of marine turtles in the coastal areas of Balochistan'.
		July (?) 1996	Shrimp export embargo was lifted in Pakistan following an appeal by Pakistani exporters.
8 Oct 1996	Case of shrimp export ban brought to the WTO by India, Malaysia, Pakistan and Thailand. Objecting to the unilateral and extra-territorial nature of the trade measure. The complainants claimed that the US embargo constituted a violation of the following legislation: <ul style="list-style-type: none"> GATT Article XI: prohibiting the use of quantitative trade restrictions such as embargoes The 'most-favoured-nation principle' (GATT Article I.1): because the US treats physically identical shrimp(products) differently. The import ban was discriminatory under GATT Article XIII.1, because newly affected nations were given a shorter period to comply than those initially affected. 	8 Oct 1996	Case of shrimp export ban brought to the WTO by India, Malaysia, Pakistan and Thailand. Objecting to the unilateral and extra-territorial nature of the trade measure. The complainants claimed that the US embargo constituted a violation of the following legislation: <ul style="list-style-type: none"> GATT Article XI: prohibiting the use of quantitative trade restrictions such as embargoes The 'most-favored-nation principle' (GATT Article I.1): because the US treats physically identical shrimp(products) differently. The import ban was discriminatory under GATT Article XIII.1, because newly affected nations were given a shorter period to comply than those initially affected.
	See next page		

Global Shrimp-Turtle Interaction Events (2)

Date	Shrimp-turtle interaction events (in Panel 2)
25 Feb 1997	Australia, Colombia, the EC, Philippines, Singapore, Hong Kong, India, Guatemala, Mexico, Japan, Nigeria and Sri Lanka reserved their third-party rights in the case of shrimp export ban.
6 April 1998	<p>WTO condemns the by the US imposed shrimp ban in the WTO panel report. The prescription of TEDs constituted an unfair trade practice.</p> <ul style="list-style-type: none"> Conform GATT Article XI: 1, the embargo is inconsistent with the obligation not to institute or maintain any prohibitions or restrictions other than duties, taxes or licences or other charges. In reference to GATT Article XX the WTO panel concluded that it could not cover certain unilateral measures, insofar as they could jeopardise the multilateral trading system.
13 July 1998	The United States Trade Representative files formal notice of appeal of the WTO condemnation in the WTO Shrimp-Turtle Report. Basing its defence on GATT Article XX: allowing countries to take measures contrary to GATT obligations when such measures are necessary to protect human, animal or plant life or health.
12 Oct 1998	The Appellate Body of the WTO has denied the United States appeal of a WTO Panel's decision of 6 April 1998. WTO's Body ruled that the turtle-safe shrimp measure was being applied by the United States in a discriminatory manner against some countries which is contrary to the requirements of GATT Article XX
6 Nov 1998	WTO's adopts the Appellate Body Report and the Panel Report on this case.