13 Fisheries-Related Mortality and Turtle Excluder Devices (TEDs)

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CONTENTS

13.1 INTRODUCTION

Sea turtles are subject to human-induced mortality during all life stages. On land, nesting females, incubating eggs, and emerging hatchlings may be impacted. The impact may be incidental, such as by disorientation by lights and disturbance on or of the beach, or it may be intentional by directed harvest of the adults and eggs. Once turtles are in the water, a vast variety of new sources of impact are brought to bear. These include pollution and marine debris, habitat degradation, directed harvest, and incidental capture or entrainment by a variety of sources, including fishing and dredging.

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In 1988, the U.S. Congress mandated a study of the causes and significance of turtle mortality in the coastal waters of the country. A study team was convened by the National Research Council's Board on Environmental Studies and Toxicology and Board on Biology. After a comprehensive review, the study team concluded that the largest human-associated source of mortality was incidental capture in shrimp trawls, associating that activity with more turtle deaths than all other human activities combined (Magnuson et al., 1990). The team estimated that as many as 44,000 turtles were killed annually by the U.S. fleet. Although other fishing gears used worldwide, including longlines, gill nets, and pots and traps, also are significant sources of mortality (Allen, 2000; Castroviejo et al., 1994; Gerosa and Casale, 1999; Gribble et al., 1998; Julian and Beeson, 1998; Lagueux, 1998), this chapter will focus on the interaction of turtles with trawl fisheries, especially those for shrimp.

13.2 THE PROBLEM

Trawls are used worldwide to catch many species of aquatic invertebrates and vertebrates. In warm waters, where turtles are most likely to occur, shrimps, or prawns, are the main species sought with trawls. Prior to the twentieth century, shrimp harvesting probably did not significantly impact turtles because the main gear, haul seines, which allow turtles to surface and breathe, was pulled by hand in very shallow coastal waters (Klima et al., 1982). Trawling for shrimp is relatively recent, beginning with the introduction of the otter trawl in the early 1900s. Trawls allowed the fishery to expand beyond shallow coastal waters, and enabled fewer workers to efficiently harvest much more than a haul seine crew. The fishery, at least in the U.S., expanded in earnest after World War II (Klima et al., 1982). The relationship between trawling effort and sea turtle mortality has been well documented (Caillouet et al., 1991; 1996; Henwood and Stuntz, 1987; Poiner and Harris, 1996; Robins, 1995). Trawls forcefully submerse the air-breathing turtles and are responsible for the drowning deaths of many; as tow duration increases so does mortality (Henwood and Stuntz, 1987).

13.3 SOLUTIONS

Mortality of sea turtles may be decreased by closing an area to trawling or by reducing tow times. Area closures impact the fishery to the greatest extent. Decreased tow times also may impact the fishery, but reduce turtle mortalities only if there is compliance with regulations. With shortened tow times, the number of hauls within a given time increases, providing shorter respites for the crew and increasing wear on deck machinery. In the U.S., tow times have not been regulated under most conditions because they are difficult to enforce, and when compliance has been evaluated, it generally has been poor. (National Marine Fisheries Service [NMFS], 2001;* Epperly et al., 1995b).

* National Marine Fisheries Service. Unpublished data. Southeast Regional Office. 9721 Executive Center Dr., St. Petersburg, FL 33702.

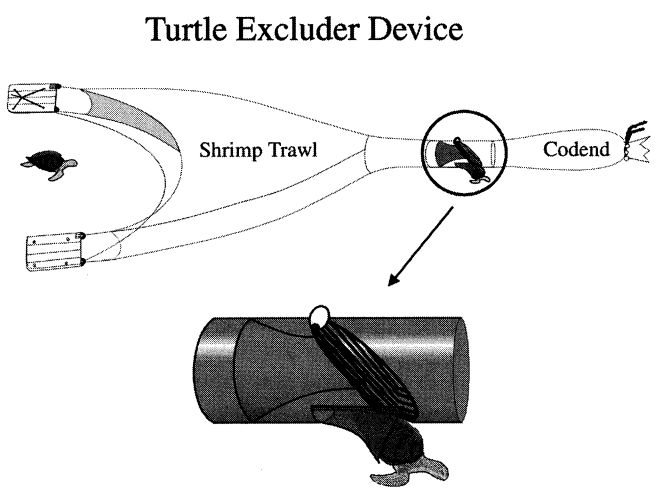

FIGURE 13.1 Schematic of a turtle excluder device showing the position of the TED in the trawl, just before the codend or tailbag. (Figure provided by NOAA Fisheries, Mississippi Laboratories, Harvesting Systems and Engineering Division.)

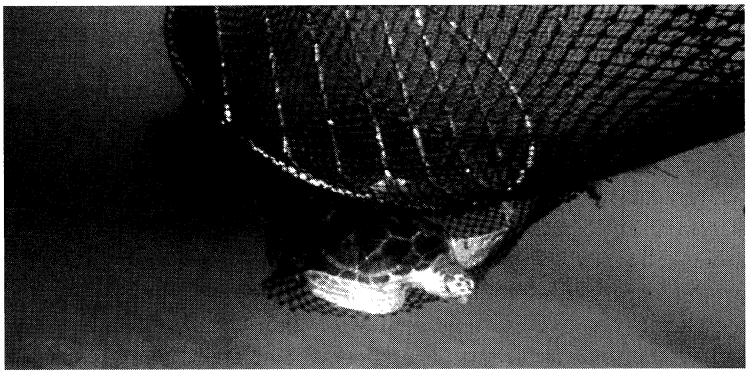

FIGURE 13.2 A loggerhead turtle, *Caretta caretta*, exiting a bottom-opening TED during TED trials in the eastern Gulf of Mexico. (Photo provided by NOAA Fisheries, Mississippi Laboratories, Harvesting Systems and Engineering Division.)

A technological solution to separate turtles from shrimps in trawls was available by the early 1980s. A turtle excluder device (TED) incorporates a trap door in the trawl, just before the tailbag or codend, to allow sea turtles to escape from the nets (Seidel and McVea, 1982) (Figure 13.1). Shrimp pass through the bars or webbing of the TED into the tailbag. Turtles and large bycatch are blocked by the TED and exit the opening (Figure 13.2). When installed properly, TEDs reduce turtle mortality and allow the fishery to continue unimpeded. Some shrimp loss may occur, but this usually is not significant (Renaud et al., 1993; Robins-Troeger et al., 1995), and the loss may be offset partially by increased efficiency realized by reduced bycatch. Decreased bycatch results in a higher quality product for the market and less work sorting catch (High et al., 1969; Brewer et al., 1998).

13.4 IMPLEMENTATION OF TEDS IN U.S. FISHERIES

13.4.1 The Process and the Shrimp Fishery*

TEDs were first developed and implemented in the U.S., but the process was protracted and contentious. Between 1970 and 1978 all six sea turtle species in U.S. waters were recognized as endangered or threatened and protected under the U.S. Endangered Species Act. Shrimp trawling was identified as a principle source of mortality in sea turtles as early as 1973 (Pritchard and Márquez, 1973); other documentation followed (Henwood and Stuntz, 1987; Hillestad et al., 1978). These studies, as well as the large numbers of loggerhead turtles, *Caretta caretta* (the most common species found in U.S. waters), washing up dead on ocean beaches caused NMFS to search for a solution. NMFS' first innovation was to install a large mesh panel of webbing over the mouth of the trawl. The panel allowed shrimp to pass and excluded most sea turtles, but the loss of shrimp was significant and sometimes turtles became entangled in the large meshes of the panel (Oravetz and Grant, 1986). The next approach was to allow everything to enter the trawl, but separate the target species from the bycatch near the codend. The design was based on a device already used by many shrimpers to exclude jellyfish when coelentrates were especially abundant. NMFS, in cooperation with commercial shrimpers, experimented with several configurations and found that turtle catch could be eliminated almost completely with little or no reduction in shrimp catches. By 1980 NMFS had a TED (Watson et al., 1986).

NMFS initially was reluctant to require TEDs for fear that additional regulations would exacerbate existing economic problems in the shrimp fishery (Oravetz and Grant, 1986). Also of concern was the agency's ability to enforce any TED regulations given the geographic scope and the number of vessels involved. NMFS anticipated that industry, with encouragement, would voluntarily accept and use the device, and over the next several years purchased and distributed a few hundred TEDs to industry. Throughout the 1980s, NMFS, Sea Grant, and conservation organizations worked with industry to encourage the use of TEDs and to improve upon the original NMFS design, which was heavy and unwieldy. As a result, several lighter designs were developed. Ultimately, however, fishermen could not relate their individual trawling activities to the turtle mortality caused collectively by the entire fleet because catch rates of turtles were relatively low: one turtle per 322.5 h fished in the Gulf of Mexico and one turtle per 20.6 h fished off the southeast U.S. (Henwood and Stuntz, 1987). Hence, they perceived TEDs as an unnecessary solution to an unfounded problem. When, in 1986, it became apparent that industry would not voluntarily adopt TEDs to save protected species — less than 1% were using them in 1985 (Oravetz and Grant, 1986) — the U.S. Fish and Wildlife Service and conservation organizations requested that the Gulf of Mexico Fishery Management Council (the organization with the authority to manage the shrimp fishery in the Gulf of Mexico) require TEDs to prevent the continued drowning of sea turtles in shrimp trawls (Center

* Much of the discussion on the implementation of TEDs in the U.S. was taken from Oravetz and Grant (1986) and Center for Marine Conservation (1995).

for Marine Conservation, 1995). They were particularly concerned about the plight of the Kemp's ridley, *Lepidochelys kempii*, which nests only in the western Gulf of Mexico. In the late 1940s, nests were estimated to be in the tens of thousands annually (Hildebrand, 1963), but by 1985 the annual number of nests had dropped below 800 (Márquez-M et al., 1989). The Council did not act to require TEDs.

Later in 1986 NMFS informally proposed TED regulations, but because the proposal exempted trawlers in particular areas of concern, the Center for Environmental Education (later the Center for Marine Conservation) notified the Department of Commerce of their intent to sue to protect sea turtles under the Endangered Species Act. Mediation meetings ensued, involving NMFS, nongovernmental organizations, and industry. When negotiations ended without agreement, NMFS drafted regulations and published a proposed rule to phase in TEDs in ocean areas seasonally over the next several years (Department of Commerce, 1987a). Public hearings on the proposed regulations began in early 1987 and by summer NMFS published final regulations (Department of Commerce, 1987b). TED opponents effectively delayed full implementation of TED regulations until 1990 by appealing to federal courts in Texas, Louisiana, and North Carolina, and to Congress. Invariably the courts eventually ruled in NMFS' favor. The U.S. Congress and the incumbent administration were more receptive to indusry complaints, at times ordering TED regulations or the enforcement thereof suspended. During this period, some individual states, such as South Carolina, Georgia, and Florida, promulgated regulations implementing TEDs in their territorial waters; sometimes these regulations also were challenged in state courts. By October 1989, however, the TED regulations were in force, but because the regulations were seasonal, they were not yet in effect in all areas.

Just as these regulations finally were implemented fully, the National Research Council's study team's report was published, conclusively supporting the need to reduce mortality by shrimp trawls (Magnuson et al., 1990). Furthermore, the study team recommended that TEDs be used in bottom trawls at most places and at most times of the year, from Cape Hatteras to the U.S.–Mexico border. Newly implemented federal regulations required TEDs seasonally and were limited to ocean trawlers. Trawlers in inshore waters were permitted to restrict tow times in lieu of using TEDs. By 1992, armed with the study team report, with evidence of significant use of inshore waters by turtles (Epperly et al., 1995a), and with the knowledge that trawlers working in inshore waters capture sea turtles (NMFS*), NMFS expanded the regulations, phasing them in over a 2-year period (Department of Commerce, 1992b). TEDs were now required in shrimp trawls throughout the year in all areas south of Cape Hatteras. Thus, by December 1994, with few exceptions, all shrimp trawlers in inshore and offshore waters were required to use TEDs in their nets at all times. Except for this major change, most other modifications of the regulations since 1987 have addressed technical design details and certification protocols.

* National Marine Fisheries Service. Unpublished data. Galveston Laboratory, 4700 Avenue U, Galveston, TX 77551.

13.4.2 Leatherback Conservation

Leatherback turtles, *Dermochelys coriacea*, are the largest of the sea turtles and lead a pelagic, mostly oceanic existence. Most of the animals in coastal waters are too large to fit through TED openings. Strandings of leatherbacks along the southeast U.S. coast predictably occur in the winter and spring, and shrimp trawling was linked to the episodic events (Department of Commerce, 1995). In response NMFS, in cooperation with the U.S. Fish and Wildlife Service and the states of South Carolina, Georgia, and Florida, developed a leatherback conservation plan for the southeast U.S. Atlantic coast (Department of Commerce, 1995), establishing a framework for short-term closures. This and subsequent rules made it illegal for shrimp trawlers to operate January–June in zones identified as having a high concentration of leatherbacks, unless the trawls were equipped with TEDs capable of excluding leatherback turtles. NMFS approved modifications to several TED designs that would allow leatherback turtles to escape the trawls. Since adopting the plan, NMFS also has required the large-opening leatherback TEDs during times of high strandings outside the conservation area (Spring, 2000 off Texas) or conservation time (December 1999 and December 2001 off northeast Florida). NMFS is considering requiring the leatherback TED modifications at more times and in more areas (Department of Commerce, 2000).

13.4.3 Exemptions

There have been a number of exemptions granted to TED requirements; all but one were temporary. When tropical storms have battered the southeastern U.S. coast and afterwards a significant amount of debris washed downstream into coastal waters, NMFS granted a reprieve from TEDs because debris can clog a TED making the escape of turtles difficult or impossible. The exemptions allowed fishermen to substitute limited tow times for TEDs.

A small area of live bottom off central North Carolina is a productive area for shrimp trawling by local fishermen. When macroalgae on the reef are dense, detached marine algae clog the TEDs. NMFS has granted an extended exemption from TEDs in this area, allowing tow times to be used in lieu of TEDs. The area is easily policed from the beach and enforcement is handled by the state; compliance has been high (North Carolina Division of Marine Fisheries*).

13.4.4 TEDs in Other Fisheries

Bottom trawls are used in other fisheries and where those fisheries overlap with turtles, turtles also are captured. Since 1992 TEDs have been required in the winter trawl fishery for summer flounder, *Paralichthys dentatus,* while operating between Cape Charles, Virginia and the North Carolina–South Carolina border (Department of Commerce, 1992a). Data collected November 1991–February 1992 showed that the fishery incidentally captured significant numbers of turtles (>1000) during the turtles' seasonal southward migration along the Atlantic coast of the U.S. (Epperly et al., 1995b). The National

* North Carolina Division of Marine Fisheries. Unpublished annual reports to NMFS for incidental take permit no. 1008. P.O. Box 769, Morehead City, N.C. 28557.

Research Council (NRC) study team previously had identified the fishery as a source of mortality. Although unpopular with local fishermen, TED regulations implemented in this finfish fishery were not contested in the courts.

Other bottom trawl fisheries in the western North Atlantic have been linked to the mortality of sea turtles. In South Carolina, whelk trawling is allowed only when water temperatures are less than 18°C (64°F) and since December 2000 whelk trawls used in Georgia waters are required to have TEDs (NMFS Southeast Fisheries Science Center, 2001).

13.4.5 Turtle Exclusion

TED designs must be certified by NMFS, based on a specific protocol (Department of Commerce, 1987b, 1990, 1992b). Foremost among the criteria for certification is the requirement that a prospective design releases 97% of the turtles tested or alternatively that it performs as well as a previously certified control TED. Certified designs, therefore, are assumed to reduce mortality of sea turtles 97%. A number of studies, however, indicate that the actual reduction realized is substantially less. Strandings on South Carolina and Georgia beaches were reduced 37–58% (Crowder et al., 1995; Royle and Crowder, 1998* as cited in Turtle Expert Working Group [TEWG], 2000; Royle, 2000**, as cited in TEWG, 2000) and estimates of a post-1990 multiplier of instantaneous mortality for benthic Kemp's ridley turtles range from 0.45 to 0.56, indicating a decrease in mortality coincident with the implementation of TEDs (Heppell et al., in press, a).

A recent analysis of strandings data revealed that the minimum opening of TEDs, measured as the height and width of a taut triangle, is too small to exclude the larger individuals of several species (Epperly and Teas, 2002). A significant proportion of loggerheads stranding along the east coast of the U.S. and in the Gulf of Mexico (33–47% annually), and a small proportion of green turtles, *Chelonia mydas* (1–7% annually), were too large to fit through the opening; their body depths exceeded the height of the openings. Loggerhead turtles were too large to fit through the opening at a size where most are still immature. Thus, not all sizes of loggerhead and green turtles are benefiting from TEDs since they cannot escape from the nets. Early population models evaluating the potential effect of TEDs on the loggerhead population trajectory assumed that TEDs benefited all benthic life stages (Crowder et al., 1994). TED size opening is not an issue for Kemp's ridleys because they do not attain a large size and all can fit through the existing minimum openings.

Genetic studies have indicated multiple demographic units within sea turtle species and these are regarded as management units (Bowen, 1995; Fitzsimons et al., 1995). Some of the loggerhead management units of the western North Atlantic do not appear to be increasing and, given current population trajectories, will not reach recovery goals formulated under the U.S. Endangered Species Act. Popula-

* Royle, J.A. and L.B. Crowder. 1998. Estimation of a TED effect from loggerhead strandings in South Carolina and Georgia strandings data from 1980-97. Unpublished report, U.S. Fish and Wildlife Service, Laurel, MD, 12 p.

** Royle, J.A. 2000. Estimation of TED effect in Georgia shrimp strandings data. Unpublished report, U.S. Fish and Wildlife Service, Laurel, MD, 11 p.

tion models have demonstrated a need to further decrease mortality in the benthic and oceanic pelagic stages of loggerheads in order to move these stable or declining subpopulations towards recovery (NMFS Southeast Fisheries Science Center, 2001; Heppell et al., in press, b). One identified management action that would result in fewer deaths of large benthic sea turtles would be to require larger TED openings. NMFS issued an advance notice of proposed rulemaking in April 2000 and is pursuing a final rule to require larger openings in all areas (Department of Commerce, 2000).

13.5 IMPLEMENTATION OF TEDS IN SHRIMP FISHERIES WORLDWIDE

During the development of TEDs in the U.S., scuba-diver observations indicated behavorial differences in fish and shrimp that could be used to separate shrimp from finfish (Watson et al., 1986). Design modifications of the original TED were effective in reducing finfish bycatch, and TED also became the acronym worldwide for trawl efficiency device. While the U.S. was grappling with implementation of TEDs, other countries were beginning to investigate their use, often for their potential to reduce finfish bycatch. One of the first countries to require TEDs was Indonesia (Oravetz and Grant, 1986). After learning about TEDS, rather than ending their joint venture with the Japanese, as contemplated, Indonesia decided to allow the Japanese fishermen to fish inside Indonesian waters with TED-equipped nets and Indonesian crews. At the time, other countries throughout the world were inquiring about TEDs and some, like Australia, were beginning to experiment with them.

13.5.1 Implementation of TEDs in Australia*

All marine turtles occurring in Australian waters are listed as either endangered or vulnerable on the Australian Endangered Species Act of 1992. Australian trawlers had used systems to reduce jellyfish and had tested various experimental designs, but still resisted the introduction of TEDs, citing handling and safety concerns and a concern about loss of prawns (Mounsey et al., 1995). In the early 1990s Australia introduced TEDs into the prawn fisheries of at least three regions. In the northern fisheries, sea turtle bycatch was driving the implementation of TEDs and groups outside the fishing community (e.g., conservationists and government) were pushing the issue. In 1989–1990, 5000–6000 turtles were estimated captured annually in the northern fishery (Poiner and Harris, 1996). In another fishery off the east coast of Queensland, annual captures were estimated to be 5295 ± 1231 (Robins, 1995). In New South Wales finfish bycatch was the driving factor and reduction in bycatch was being pushed by representatives of other fisheries, commercial and recreational, as well as by the government. In Gulf St. Vincent, a southern fishery, catch of small prawns and fish was the driving factor and bycatch reduction was championed by the fishermen themselves. The approach to introduce the TEDs differed in each area, and many designs were tested or developed (e.g., AusTED and AusTED II) (Brewer et al., 1998).

* Much of the discussion concerning Australia's implementation of TEDs is from Kennelly (1999).

Similar to the experience in the U.S., most fishermen would not voluntarily use TEDs to protect sea turtles; in some northern ports use was 0–20% and in others it was as high as 50–80%. Fishers used TEDs when they perceived a benefit to their use (turtle or jellyfish exclusion) or when they were used with no adverse impact. When finfish bycatch was the issue, once the best devices were identified through testing, 50–100% of the fishers voluntarily used them. When undersized prawns were the issue, virtually all fishers adopted TEDs. When prawn fishers had a vested interest, such as in the southern fisheries, the problem did not first have to be quantified; the researchers could skip directly to the testing phase and involve the fishermen immediately and directly. When fishers did not have a vested interest, such as in the northern fisheries, even after the problem was quantified, most still were not all willing to use TEDs. In the case of New South Wales, the response was intermediate. Although bycatch reduction was being driven from outside the fishery, because industry was involved at an earlier stage than for the northern fishermen in gear development and testing, a greater proportion used TEDs voluntarily. Kennelly (1999) concluded that the sooner and more fully industry is involved, the sooner and greater voluntary acceptance will be. In all cases, however, the government of Australia legislated, over a period of 3 years, the use of TEDs selectively, either for turtle exclusion or bycatch reduction. TED use in the Queensland east coast fishery began in selected areas in 1999 and their use in the northern prawn fishery was mandatory in 2000.

13.5.2 U.S. Public Law 101–162, Section 609

In 1988, at the urging of the shrimp industry, the U.S. Congress passed Public Law 101–162, Section 609. Section 609 prohibits the import into the U.S. of shrimp and shrimp products that were harvested in a manner that may adversely affect sea turtle species. Annually, the Department of State (DOS) certifies to Congress that the governments of certain harvesting nations have taken specific measures to reduce the incidental capture of sea turtles by their shrimp trawl fisheries, or that the fishing environment of those nations does not pose a threat to sea turtles. The latter situation can include fisheries that harvest shrimp manually or fisheries that occur only in cold water where they pose little or no risk to poikilothermic turtles. For 2002, 17 nations met the certification standards for sea turtle conservation (Belize, Colombia, Costa Rica, Ecuador, El Salvadore, Guatemala, Guyana, Honduras, Mexico, Nicaragua, Nigeria, Pakistan, Panama, Suriname, Thailand, Trinidad and Tobago, and Venezuela) and another 24 nations (Argentina, The Bahamas, Belguim, Canada, Chile, China, Denmark, Dominican Republic, Fiji, Finland, Germany, Iceland, Ireland, Jamaica, The Netherlands, New Zealand, Norway, Oman, Peru, Russia, Sri Lanka, Sweden, the United Kingdom, and Uruguay) and 1 economy (Hong Kong) were certified as having fishing environments that do not pose a danger to sea turtles (Department of State, 2002*). Such certifications are, in part, based on site visits by the DOS and NMFS. Currently the import of shrimp into the U.S. from other

* U.S. Department of State. April 30, 2002. Sea turtle conservation and shrimp imports. http://www.state.gov/r/pa/prs/ps/2002/9880pf.htm.

nations is prohibited unless the individual, clearly marked shipment meets special criteria, such as harvested by aquaculture, in cold waters, or by techniques that do not harm sea turtles (e.g., by nets using TEDs). Two nations, Brazil and Australia, had demonstrated that they had an enforcement and catch segregation system in place for making individual shipment certifications (Department of State, 2002).

One consideration in determining whether a sea turtle conservation program of a nation is comparable to that of the U.S. is their TED design. Currently there are two sets of regulations in the U.S. The required minimum size of the TED opening differs in the Gulf of Mexico and the Atlantic; the allowed opening is smaller in the Gulf (Department of Commerce, 1987b). It is the minimum regulation — the smaller opening for TEDs used in the Gulf of Mexico — that the DOS uses as their standard during comparisons, although there are situations where the leatherback modification is required. As the U.S. considers changes to their regulations to increase the size of the openings (Department of Commerce, 2000), it is with the knowledge that the changes could have impact worldwide.

Section 609, although apparently intended to protect the U.S. domestic shrimp industry rather than to protect sea turtles (U.S. Court of Appeals for the Federal Circuit, 2002)*, has the potential to have a very significant positive impact on sea turtle conservation worldwide. Section 609 was an innovative solution, using the markets to apply pressure worldwide. There still are many countries that do not export shrimp to the U.S., but do export them elsewhere, and some harvest shrimp without TEDs in areas where turtles are known to occur. One such market is the European Union, which currently does not have a law comparable to Section 609, and accepts shrimp harvested without TEDs.

13.5.2.1 U.S. Court of International Trade**

The DOS originally interpreted PL101-162, Section 609 to apply only within the Wider Caribbean and Western Atlantic region. Environmental and animal rights groups filed suit in the U.S. Court of International Trade, primarily to overturn the limited geographic scope of application of the law by the DOS. In December 1995 the Court ruled that Congress intended Section 609 to apply on a worldwide basis and ordered the department to comply. A request by DOS for a 1-year delay was denied by the Court. As a result, the importation of shrimp from many nations was prohibited on May 1, 1996. The plaintiffs reopened the litigation to reverse one aspect of the changes that DOS made — to allow an individual shipment from a noncertified country, if that shipment could be certified to contain only shrimp harvested under conditions that were not harmful to sea turtles. The plaintiffs argued that unless there was a program nationwide, all shrimp imports from the country should be prohibited according to Section 609. The Court originally ruled in favor of the plaintiffs, but the decision was vacated in 1998 by the U.S. Court of Appeals

* The U.S. Court of Appeals for the Federal Circuit and the World Trade Organization reached different conclusions about the purpose of the law. See discussion in Section 13.5.2.2.

** Information for this section is taken from U.S. Court of Appeals for the Federal Circuit. 2002. 00-1569, -1581, -1582, 36 pp. The full document can be viewed and downloaded at http://www.ll.georgetown.edu/Fed-Ct/Circuit/fed/opinions/00-1569.html.

for the Federal Circuit as they found that the plaintiffs had unilaterally and unconditionally withdrawn their original motion.

The plaintiffs filed suit and, in 1999, once again the Court found that importation of shrimp from noncertified countries violated the provisions of Section 609. The DOS issued the 1999 guidelines, still allowing importation of shrimp shipments from noncertified countries. In 2000, the Court held yet again that the shipment-by-shipment approach violated Section 609, but denied plaintiffs an injunction. The plaintiffs appealed and in March 2002 the U.S. Court of Appeals for the Federal Circuit concluded that the DOS's interpretation of Section 609 was correct and held that the plaintiffs were not entitled to injunctive relief.

13.5.2.2 World Trade Organization*

Claiming that the shrimp embargo was an "improper restriction on trade" and therefore violated the General Agreement on Tariffs and Trade (GATT), in September 1996, India, Malaysia, Pakistan, and Thailand, all recently affected by Section 609, brought a case against the U.S. in the WTO. The U.S. argued that specific sections of the WTO Agreement [Sections XX(b) and (g)] permitted members to take measures to protect life or conserve exhaustible natural resources, even if such measures were in conflict with other provisions of the Agreement. An arbitration panel ruled against the U.S. on most points in May 1998 (WTO, 1998a). The U.S. appealed the decision. On October 12, 1998, the WTO Appellate Body reversed the panel's findings on many issues, most notably finding that Section 609 qualified for provisional justification under Article XX(g), since it addressed the conservation of exhaustible natural resources (WTO, 1998b). However, the Appellate Body did find that some aspects concerning the way in which the DOS was implementing the Section were, in aggregate, in violation of U.S. obligations under the Agreement. The body determined that DOS should revise its implementation of Section 609. The DOS adopted those recommendations and (1) now considers any evidence that another nation presents that its sea turtle conservation program is comparable, not necessarily identical, to that of the U.S.; (2) instituted procedural changes so that the process is more transparent and predictable to nations and provides to governments not granted certification a full explanation for that decision; (3) facilitated a Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and South-East Asia; and (4) now offers technical training concerning TEDs to any requesting government.

Malaysia returned alone to the WTO with a new complaint that the U.S. had not fully complied with the original ruling. Three members of the original panel rejected that argument in June 2001, and, in October 2001, the WTO Appellate Body turned down a Malaysian appeal (WTO, 2001a, 2001b).

* The WTO Panel Reports, Appellate Body Reports, and Arbitrator's Reports can be viewed and downloaded at the WTO's website at http://www.wto.org/english/tratop_e/dispu_e/distab_e.htm#r58. They were the source material for the discussion of this section.

13.6 CONCLUSIONS

Trawl fisheries and sea turtles can coexist. Implementation of TEDs has been a protracted and contentious process. When properly installed in bottom trawls, TEDs can effectively exclude sea turtles and save significant numbers from drowning. When TEDs with large escape openings are used, virtually all turtles can escape with minimal impact on the fisheries. TEDs are in use throughout the world, in part, because of U.S. Public Law 101-162, Section 609, which uses market forces to provide an incentive for sea turtle conservation to all nations wishing to export shrimp to the U.S. However, a significant number of nations export their shrimp to other markets and do not use TEDs, despite operating fisheries in areas where turtles are likely to occur. Conservation communities worldwide are applying pressure to increase the number of nations employing TEDs in their warm water bottom trawl fisheries.

13.7 ACKNOWLEDGMENTS

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