

Sea Turtles & Shrimp Trawlers

Find out about

Sea Turtles

The Endangered Species Act

Shrimp Fishing

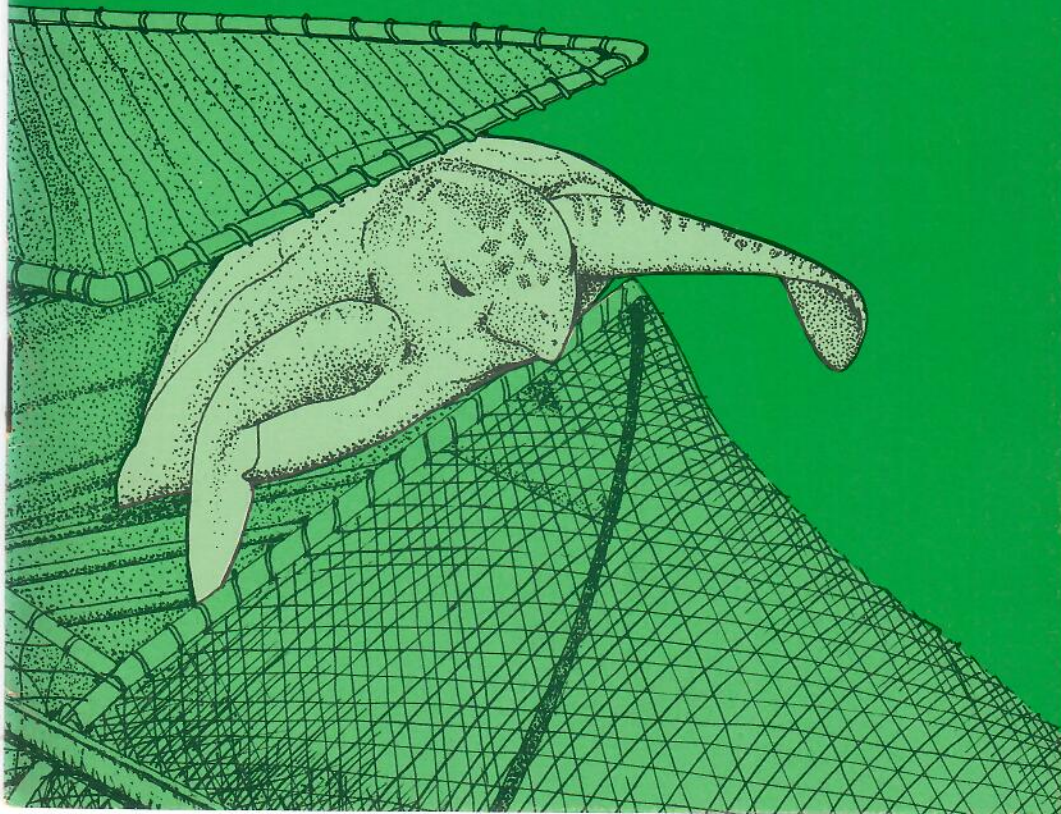
Sea Turtles and Shrimp Fishing

Legal Aspects of Commercial Shrimp Fishing

The Trawling Efficiency Device

The Center for Environmental Education

Where to Find More Information



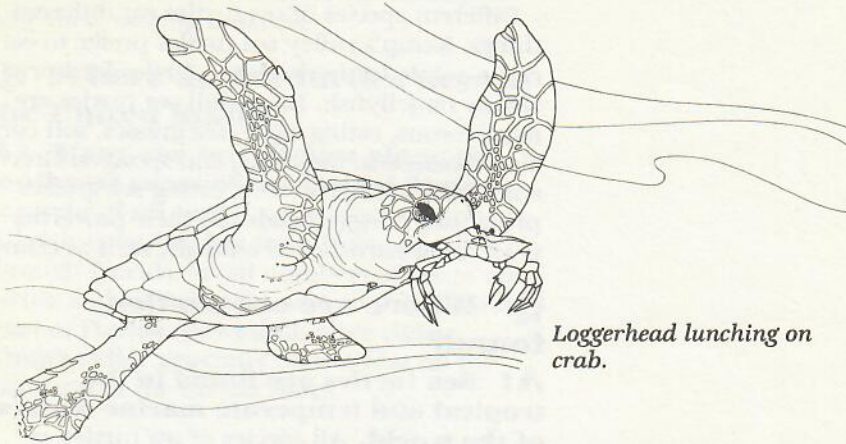
The Center for Environmental Education (CEE) is one of America's leading advocates for the protection and enlightened use of the ocean and its marine life. Established in 1972, it has gained over 500,000 supporters of its efforts to maintain the health of the ocean.

CEE works with industries, universities, conservation groups, state, federal, and foreign governments, and private citizens on issues affecting marine environmental quality, on saving endangered species, and on educating the public on the values of and threats to the ocean.

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Sea Turtles and Shrimp Trawlers



Loggerhead lunching on crab.

Every year thousands of endangered and threatened sea turtles needlessly drown in the nets of shrimp fishermen off our coasts from North Carolina to Texas. The Trawling Efficiency Device (TED) is a technological solution to this problem, but governmental and non-governmental efforts to promote voluntary use of the TED have faltered. For this reason, the Center for Environmental Education (CEE) has called upon the National Marine Fisheries Service (NMFS) to require the use of the TED in shrimp nets by 1987.

Some common questions raised about this issue are answered in the following pages.

Sea Turtles

Q: What are sea turtles?

A: Sea turtles are air-breathing reptiles that spend most of their lives in the ocean. There are seven species of sea turtles: loggerhead, green, Kemp's ridley, olive ridley, Australian flatback, hawksbill, and leatherback. Many scientists recognize an eighth species: the Pacific green.

In the course of evolution, the overall shape of sea turtles has become streamlined and their legs have become flippers. The Kemp's ridley, with an adult weight of less than 100 pounds and a shell 26 inches long, is the smallest and rarest of the sea turtles. Adult

leatherback sea turtles, the largest, average about 1,000 pounds and a length of five feet.

Different species of sea turtles eat different things. Kemp's ridley sea turtles prefer to eat crabs, while leatherback sea turtles feed principally on jellyfish. Hawksbill sea turtles are omnivorous, eating algae, sea grasses, soft corals, crustaceans, mollusks, and sponges. Green sea turtles are herbivores, eating sea grasses principally. Loggerheads use their powerful jaws to eat hardshelled animals, such as clams.

Q: Where are sea turtles found?

A: Sea turtles are found in the tropical and temperate marine waters of the world. All species of sea turtles except the Australian green may be found in U.S. waters. Only adult female sea turtles regularly leave their watery homes for the land when they nest on beaches around the world. Because of the difficulty of studying these animals in the water, we have relatively little information on their distribution there. Some general remarks can be made, however.

Like many other animals, sea turtles are found in different areas of the ocean at different times of the year. Adult Kemp's ridley sea turtles, for instance, gather near their principal nesting beach in Mexico before and during the nesting season, which runs from early spring through the summer. During the fall and winter, these animals disperse to their feeding grounds in the Gulf of Mexico and the Bay of Campeche. Young Kemp's ridleys may be found in still different areas, as widely dispersed as Cape Cod Bay, Chesapeake Bay, and the waters near the mouth of the Mississippi River.

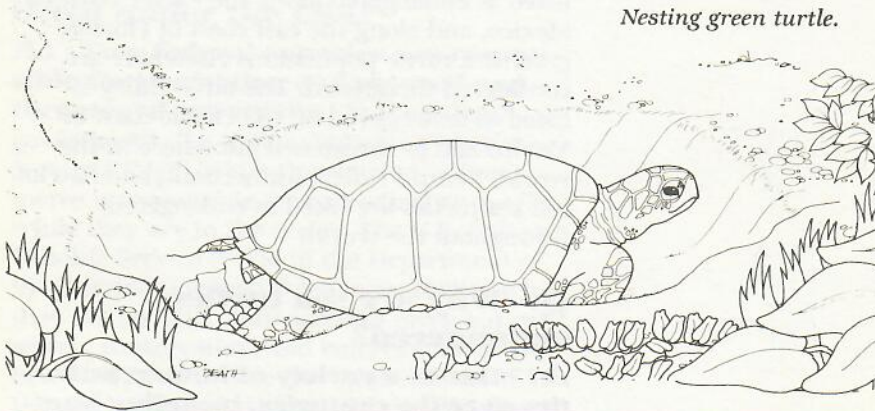
Leatherbacks prefer deep water, and therefore are generally found far from shore. On the Atlantic coast, green sea turtles roam shallow areas from Massachusetts southward to Florida and throughout the Gulf of Mexico and the Caribbean Sea. Hawksbill turtles prefer warm shallow areas, especially where there are outcroppings like coral reefs. Log-

gerheads are the most abundant sea turtles in U.S. waters and are found for the most part near their nesting beaches.

Q: Where do sea turtles nest in the United States?

A: Many sea turtles nest along the southeast coast of the United States.

Loggerhead sea turtles nest principally on Atlantic coast beaches from North Carolina through Florida. Small numbers of green sea turtles and leatherbacks nest on the Atlantic coast of Florida. Hawksbill, olive ridley, Kemp's ridley generally do not nest on the mainland of the United States.



Nesting green turtle.

Q: What is the Endangered Species Act?

A: The Endangered Species Act (ESA) is a federal law, passed by Congress in 1973, which gives protection to populations of endangered and threatened species and the ecosystems upon which they depend. The ESA requires that all federal agencies use their powers to conserve endangered and threatened species. In order to receive the protection of the ESA, a species must first be "listed" as threatened or endangered by the Department of Interior or of Commerce.

The Endangered Species Act

The ESA forbids any person from "taking" a species listed as in danger of extinction. Taking includes harassment, collection, capture, injury, or killing. The ESA does not prohibit the taking of species listed as threatened. Rather, the responsible federal agency is supposed to issue whatever regulations are necessary for the conservation of a threatened species.

Q: Which sea turtles are listed under the ESA?

A: All species of sea turtles, except for the Australian flatback, are listed under the ESA. Loggerhead sea turtles are listed as threatened. The green sea turtle is listed as endangered along the Pacific coast of Mexico, and along the east coast of Florida; green sea turtle populations elsewhere are considered threatened. The olive ridley is listed as endangered off the Pacific coast of Mexico and as threatened elsewhere in the world. Kemp's ridley, leatherback, and hawksbill sea turtles are listed as endangered throughout the world.

Q: Why are sea turtles endangered?

A: Due to a variety of human activities over the centuries, including hunting for commercial trade and destruction of nesting beaches, sea turtle populations have declined significantly.

For instance, as recently as 1947 more than 40,000 female Kemp's ridley sea turtles nested in a single day on the species' main nesting beach at Rancho Nuevo in the State of Tamaulipas, Mexico. The wholesale collection of eggs and slaughter of nesting females so decimated the species that since 1978 no more than 250 animals have nested in a single day. Last year, only 117 females nested during the species' largest nesting, called an *arribada*.

The Mexican government (since 1966), the U.S. Fish and Wildlife Service (since 1978), and other groups have virtually eliminated

egg poaching and the hunting of females in Mexico. During the same period, however, the shrimp fleet has grown considerably and incidental drowning of Kemp's ridleys in shrimp nets has become the major threat to the continued existence of this entire species. There remain probably less than 500 adult females—the species' hope for the future.

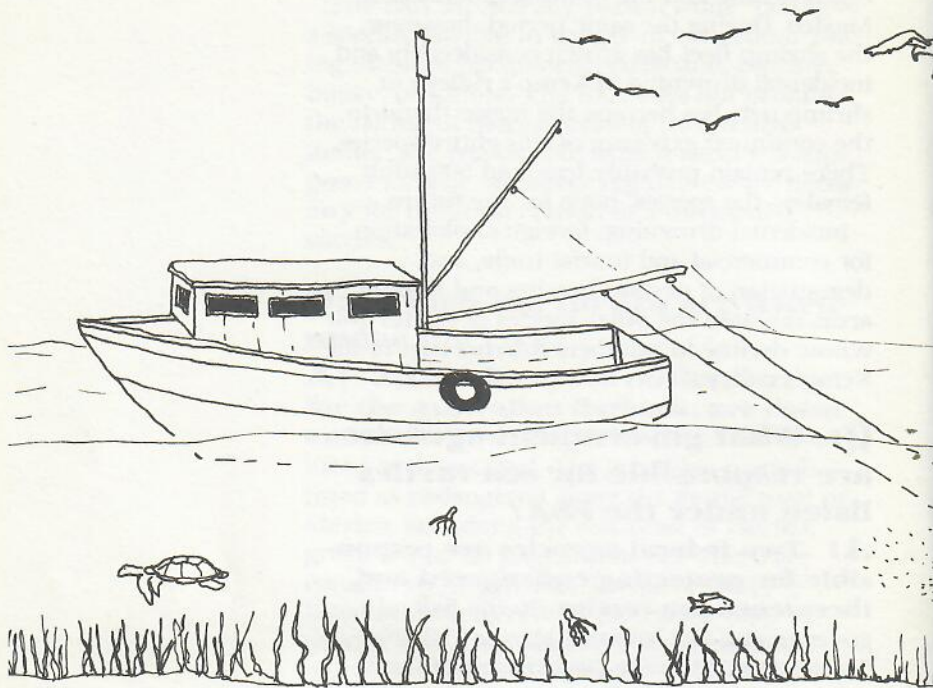
Incidental drowning, foreign exploitation for commercial and tourist trade, and degradation of nesting beaches and feeding areas threaten the other species of sea turtles, whose decline in numbers mirrors that of the Kemp's ridley.

Q: What government agencies are responsible for sea turtles listed under the ESA?

A: Two federal agencies are responsible for protecting endangered and threatened sea turtles. In the federal government, the National Marine Fisheries Service (NMFS) in the Department of Commerce is responsible for protecting sea turtles while they are in the water. The U.S. Fish and Wildlife Service (FWS) in the Department of the Interior is responsible for sea turtles when they are on land. Both agencies carry out research, conservation, and enforcement activities. NMFS recently reviewed the status of U.S. sea turtle populations and decided that they should continue to receive the protection of the ESA.

Several years ago, NMFS convened a team of sea turtle scientists to develop a plan of actions necessary for preventing the extinction of sea turtle populations in the southeastern United States and for promoting their recovery. The resulting plan of the U.S. Sea Turtle Recovery Team was accepted by NMFS in 1984.

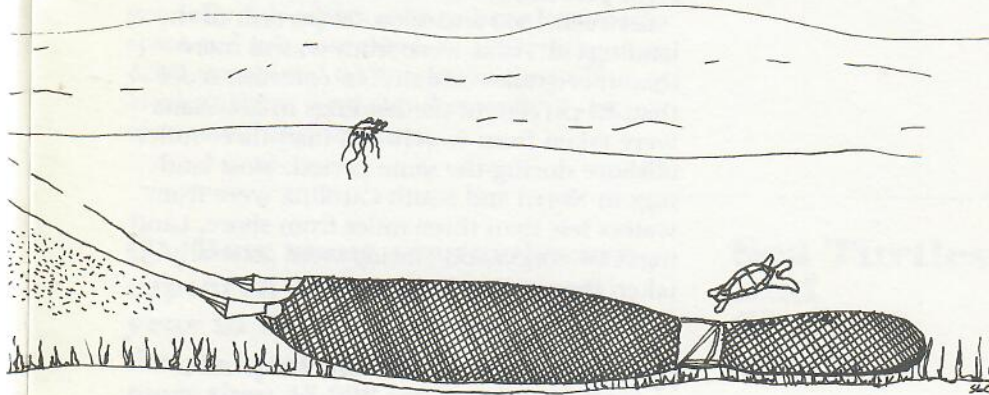
Each coastal state in the southeastern United States has a wildlife resource agency that is responsible for endangered species. State laws must be consistent with the federal ESA.



Shrimp Fishing

Around the world, shrimp fishermen often deploy their trawls (nets) in the same waters used by sea turtles. When a turtle finds itself in the path of a trawl, it generally tries to swim faster than the trawl, instead of swimming out of its path. As the turtle tires, it is overtaken and finally caught in the trawl. Then, if the trawl is not pulled out of the water soon, the turtle will drown. A turtle that is exhausted by one capture may not survive a later capture if it occurs soon after the first.

In interviews conducted in the mid-1970s, southeastern U.S. shrimp fishermen estimated that they captured from two to more than 50 turtles each season depending upon the area. Fishermen's estimates of mortality rates for captured sea turtles ranged from about eight percent to about 43 percent, depending upon the time of year and the geographical area. These estimates are conservative.



Q: How is shrimp fishing conducted?

A: Generally, commercial shrimp fishermen pull two or four trawls through the water behind a boat. The trawls, which may be fifteen feet high and more than forty feet across, are pulled a few inches above the ocean bottom. Agitated by the net's movements, shrimp jump off the bottom in front of the trawls. The shrimp, as well as other sea life, are gradually overtaken by the trawls as they pass through the water. Eventually, the shrimp and other sea life are concentrated into the bag, or cod-end, at the back of the trawl.

Q: Where is shrimp fishing done?

A: The principal shrimp fishery in the U.S. extends from North Carolina

TED equipped shrimp trawl allows turtles, finfish and other bycatch to safely escape.

to Texas. This southeastern shrimp fishery accounts for 82 percent of the annual U.S. catch of 306 million pounds of shrimp valued at \$470 million. The commercial shrimp fishery in the Gulf of Mexico lands far more shrimp than the South Atlantic fishery. For instance, Louisiana and Texas bring in more than half of the shrimp landings in the entire United States. North Carolina, South Carolina, Georgia, and eastern Florida account for only eight percent.

Between 1980 and 1984, 75 percent of the landings in Texas were from waters more than three miles offshore. In contrast, more than 59 percent of the landings in Louisiana were taken from waters less than three miles offshore during the same period. Most landings in North and South Carolina were from waters less than three miles from shore. Landings in Georgia and Florida were generally taken from more distant waters.

Q: What kinds of shrimp are caught?

A: Three species of shrimp make up most of the catch: brown, white, and pink shrimp. Brown shrimp, the most commonly caught species, generally are found in waters less than 180 feet deep in the Gulf of Mexico, primarily along the coasts of Mississippi, Louisiana, and Texas. The Gulf season begins in May, peaks in June and July, and declines to an April low. In the South Atlantic, this season generally begins in June or July.

The second most common species, white shrimp, generally is caught in waters less than 90 feet deep. The annual catch peaks in May and again in late summer and early fall. The largest catches are west of the Mississippi to Freeport, Texas. The white shrimp season in the South Atlantic, principally off Florida, Georgia, and South Carolina, begins around August and lasts through December.

Pink shrimp are found along the Gulf coast, but are concentrated off southwestern Florida. They are caught in waters less than 150 feet



Brown Shrimp
Penaeus aztecus

deep. The season peaks between May and October.

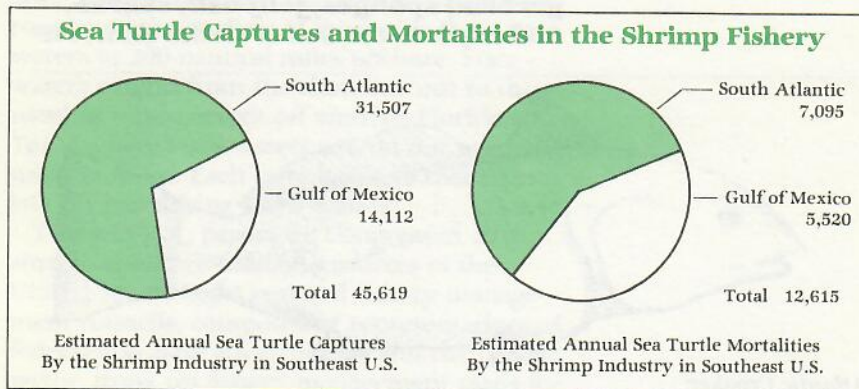
Q: How big is the southeastern commercial shrimp fishing fleet?

A: In 1983, there were an estimated 6,405 vessels and 7,653 boats in the southeastern shrimp fishery. *Vessels* have 500 cubic feet of interior space and generally fish offshore. *Boats* have less interior space and fish near shore. In 1983, there were 4,999 vessels and 6,439 boats in the Gulf of Mexico. There were also thousands of non-commercial shrimp boats.

Q: How many sea turtles are captured and drowned each year in the U.S. shrimp fleet?

A: In 1983, NMFS estimated that more than 45,000 sea turtles of five species are "incidentally captured" in the southeastern commercial shrimp fishery. Of these, about 31,000 are taken in the South Atlantic shrimp fishery and about 14,000 are taken in the Gulf of Mexico. While many of these captured turtles survive the ordeal, NMFS estimated that more than 7,000 drown in the South Atlantic

Sea Turtles and Shrimp Fishing



and about 5,500 drown in the Gulf of Mexico.

Most of the captured sea turtles are juvenile loggerheads. But, adult loggerheads also are captured as are adult greens and Kemp's ridleys. In the Gulf of Mexico, juvenile Kemp's ridley sea turtles are caught principally in shallow water areas where a favorite food item, blue crabs, is found. Adult Kemp's ridleys may be caught inshore or offshore as they migrate between feeding areas and their nesting area in Mexico.

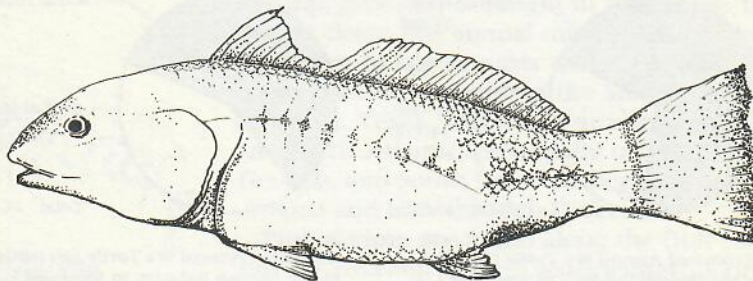
Q: Are sea turtles caught and drowned in other fisheries?

A. Yes, but in very limited numbers.

A study funded by the Center for Environmental Education found that most major types of fishing gear incidentally capture and drown sea turtles. The clearest cases involve large-meshed gill nets, as set for sturgeon for instance, and offshore longline fisheries for tuna and billfish. Sea turtles are also captured in the pound net fishery in the Chesapeake Bay.

Q: Does the shrimp fleet catch anything other than shrimp and sea turtles?

A: The shrimp fleet often catches other sea life, including various species of crabs and finfishes, loggerhead sponges, jellyfish, sharks, and rays. In the Gulf of Mexico alone, the



Atlantic Croaker

shrimp fishery catches and discards about 1.5 billion pounds of finfish, such as sea trout, croaker, spot, mackerel, and snapper. On the average, ten pounds of finfish are caught and discarded for every pound of shrimp landed in the Gulf of Mexico. Many of these fishes are desirable to other commercial and recreational fishermen. Indeed, 70 percent of the discarded fish are of species for which Gulf groundfishermen fish.

Q: What laws are relevant to the incidental capture and drowning of sea turtles?

A: The Endangered Species Act and the Magnuson Fishery Conservation and Management Act (MFCMA) are relevant to this issue. The incidental capture or drowning of endangered sea turtles anywhere is illegal under the federal Endangered Species Act and similar state laws. Under federal regulations, fishermen must return to the water captured loggerhead sea turtles. If a captured turtle is comatose, fishermen are to attempt to resuscitate the animal before returning it to the water.

Under the Magnuson Fishery Conservation and Management Act (MFCMA), fishing activities conducted in the "fishery conservation zone" must be consistent with other federal laws such as the ESA. The federal "fishery conservation zone" or FCZ extends from state waters to 200 nautical miles offshore. State waters extend from the shoreline out to three nautical miles, except off western Florida and Texas where state waters extend out to nine nautical miles. Each state has laws that regulate shrimp fishing in its waters.

The MCFMA, passed by Congress in 1976, aims to conserve fishery resources of the United States. Eight regional fishery management councils, composed of representatives of federal and state governments and the private sector, draw up fishery management plans for

Legal Aspects of Commercial Shrimp Fishing

fisheries in the fishery conservation zone. The Secretary of Commerce reviews these plans, and if they meet the standards of the MFCMA, he approves them and issues regulations to implement them. The councils review their plans periodically and amend them as necessary. Except in special circumstances, the individual states retain authority to manage fishing activities in state waters.

Q: How does the MFCMA relate to the shrimp fishery?

A: The Gulf of Mexico Regional Fishery Management Council, which manages fisheries in the FCZ off Texas, Louisiana, Mississippi, Alabama, and western Florida, issued a fishery management plan for the Gulf shrimp fishery in 1981. The Secretary of Commerce approved the plan and issued implementing regulations in May 1981. The Council is currently reviewing this plan with a view to amending it.

The South Atlantic Fishery Management Council, which covers North Carolina, South Carolina, Georgia, and eastern Florida, is considering preparing a fishery management plan for the South Atlantic shrimp fishery.

Q: How does the Gulf shrimp fishery management plan treat incidental capture?

A: One objective of the Gulf shrimp plan is consistency with the Endangered Species Act, particularly regarding the incidental capture of sea turtles. The plan proposes an education program to inform shrimpers of the need for sea turtle conservation and of techniques to resuscitate captured sea turtles. Another objective of the Gulf plan is to minimize the incidental capture of finfish by shrimpers. The plan encourages research on gear that will reduce incidental catch without decreasing overall shrimping efficiency.

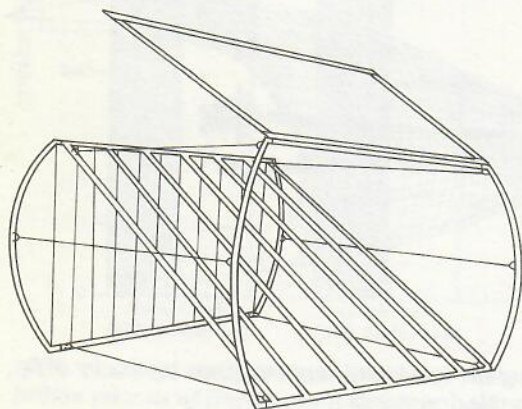
Q: Are other agencies responsible for managing shrimp fishing activities?

A: Yes. The National Marine Fisheries Service carries out the fishery management responsibilities of the Secretary of Commerce. Each state government includes a fisheries management agency. Finally, the Atlantic States Marine Fisheries Commission and the Gulf States Marine Fisheries Commission seek to coordinate state management activities.

Q: What has the federal government done to reduce the incidental drowning of sea turtles and loss of finfish?

A: Between 1978 and 1984, the National Marine Fisheries Service spent \$3.4 million in endangered species funds on a research program to develop fishing gear that would significantly reduce the incidental capture and drowning of sea turtles while maintaining the shrimp catch. This program resulted in the Turtle Excluder Device (TED) later renamed the Trawling Efficiency Device. NMFS has devoted considerable time and

**The
Trawling
Efficiency
Device
(TED)**



Slanting bars guide sea turtles and other large objects out of net through a trap door. Smaller fish, such as juvenile sea trout, swim through the bars but are repelled from continuing to the back of the net by wire cables strung vertically behind the TED. The shrimp are not affected by the bars or the cables and collect at the back.

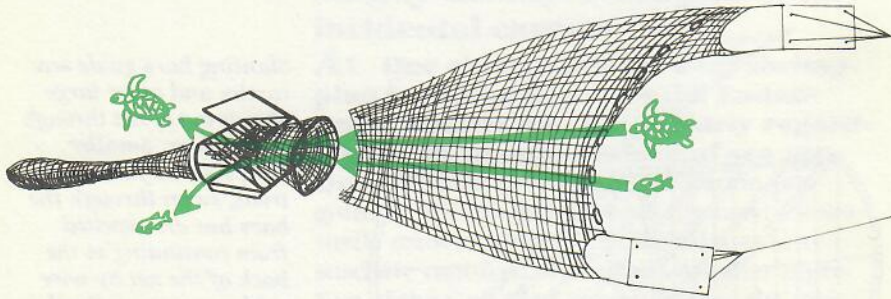
money to promoting the TED in the shrimp fishery. As a result, most shrimp fishermen know about the TED now.

Q: What is the TED and how does it work?

A: The TED is a cage-like device that is placed in front of the bag or codend of a shrimp trawl. When large objects, such as turtles, large fish or jellyfish enter the TED, they encounter bars slanting upward at a 45 degree angle. These bars force them up through a trap door and out of the shrimp net.

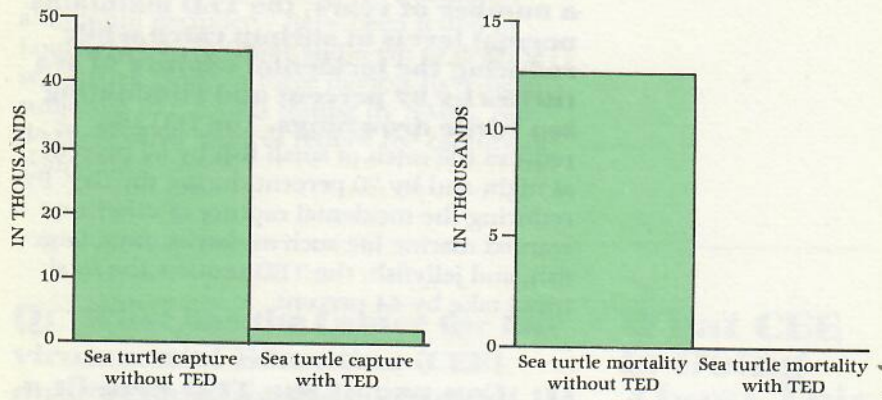
A funnel of webbing in front of the slanting bars accelerates the water flow past the bars. As a result, small objects like shrimp and juvenile finfish pass through the slanting bars. The shrimp continue to the back of the net. But finfish swim forward and try to leave the net in reaction to another grid of thin bars at the back of the TED. Panels of webbing lead most of these fish out of the sides of the TED and thus out of the trawl. The TED is collapsible, weighs about 37 pounds, and costs about \$200 for materials and about \$200 for labor.

NMFS has also successfully tested a TED that is two-thirds the size of the normal TED. This TED can work in the smaller nets that are often used inshore.



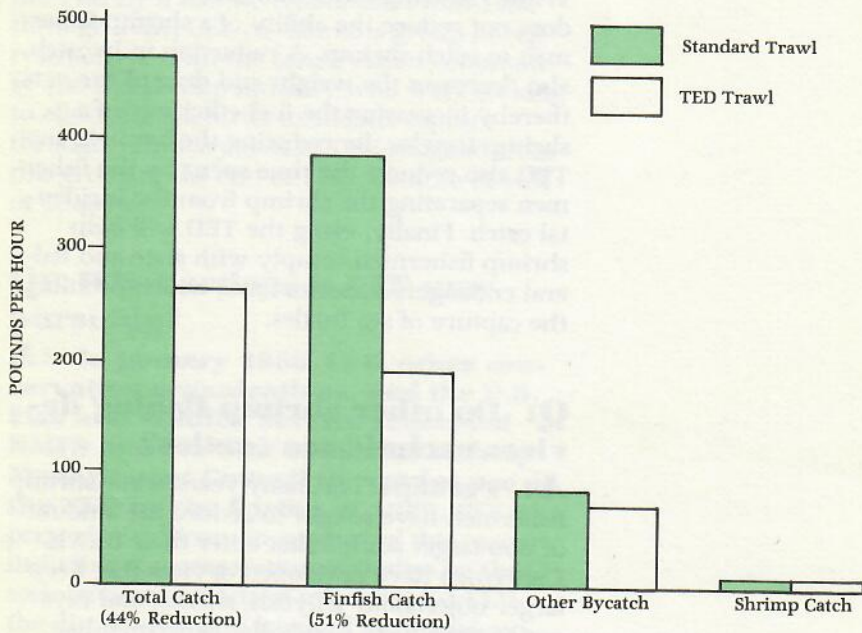
The TED is very effective, reducing the incidental capture of sea turtles by 97% and completely eliminating sea turtle drownings.

TED Reduces Sea Turtle Captures and Mortalities



If the TED were used throughout the southeastern shrimp fishery, a major threat to the survival of endangered sea turtles would be eliminated.

TED Reduces the Capture of Other Marine Life



If the TED were used by the Gulf shrimp fleet, the catch and discard of 1.5 billion pounds of finfish could be cut in half.

Q: Is the TED effective?

A: Yes. As shown by field tests over a number of years, the TED maintains normal levels of shrimp catch while reducing the incidental capture of sea turtles by 97 percent and eliminating sea turtle drownings. The TED also reduces the catch of small fish by 50 percent at night and by 70 percent during the day. By reducing the incidental capture of other unwanted marine life such as sharks, rays, large fish, and jellyfish, the TED reduces the total trawl take by 44 percent.

Q: Can use of the TED benefit a shrimp fisherman?

A: Yes. By using TEDs a shrimp fisherman can increase the quality, and therefore value, of the shrimp he catches, since the TED reduces bycatch in the bag that can damage the shrimp. While reducing incidental catch, the TED does not reduce the ability of a shrimp fisherman to catch shrimp. A reduction in bycatch also decreases the weight and drag of the nets, thereby increasing the fuel efficiency of a shrimp trawler. By reducing the bycatch, the TED also reduces the time spent by the fishermen separating the shrimp from the incidental catch. Finally, using the TED will help shrimp fishermen comply with state and federal endangered species laws, which prohibit the capture of sea turtles.

Q: Do other shrimp fishing devices exclude sea turtles?

A: Perhaps. For many years, some shrimp fishermen have sought to reduce the amount of non-target sea life that enter their trawls. Fishermen have developed devices that keep larger objects like jellyfish, sharks, and rays out of their bags. Generally, fishermen use these devices only when they encounter high concentrations of unwanted marine life. Some

of these devices, such as the "Georgia jumper," have not been tested for turtle exclusion at all, while others, such as the "Cameron aluminum excluder," have been tested in Louisiana by Sea Grant and seem to exclude sea turtles. None of these devices have been subjected to rigorous testing by NMFS. Nor do these other devices reduce the capture of young fish.

Q: What has the Center for Environmental Education (CEE) done regarding the incidental capture of turtles and finfish?

A: CEE has actively pursued a solution to this problem since 1980. In 1981, CEE outfitted two shrimp vessels in South Carolina with early versions of the TED. In 1982, CEE sponsored a cost/benefit analysis of the TED by a marine economist. From 1982 through 1985, CEE co-chaired a group of representatives from the conservation community and the shrimp industry who were seeking to eliminate sea turtle incidental capture through voluntary means. CEE resigned from this group at the end of 1985, because of lack of progress.

Q: What actions is CEE now pursuing?

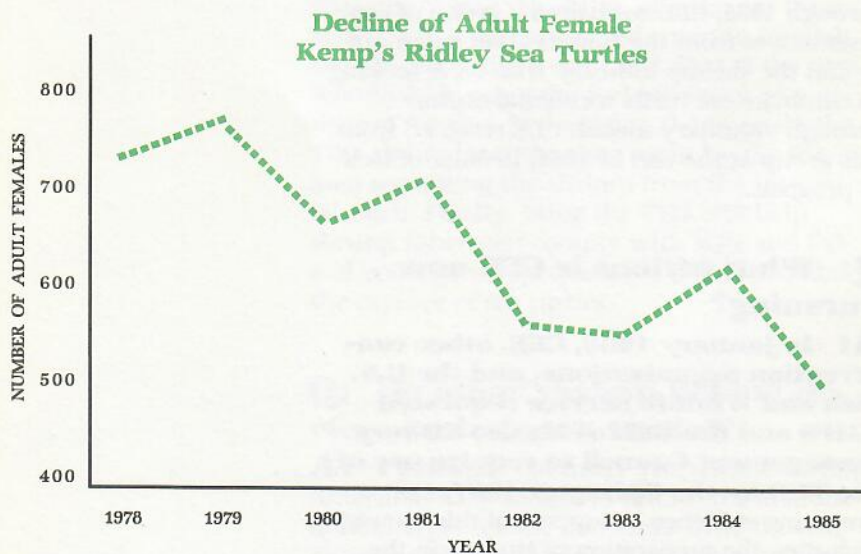
A: In January 1986, CEE, other conservation organizations, and the U.S. Fish and Wildlife Service requested NMFS and the Gulf of Mexico Fishery Management Council to require use of the TED by the Spring of 1987. CEE is preparing evidence in support of this request, including the preparation of studies on the socioeconomic effects of requiring the TED, the distribution and levels of incidental capture of sea turtles, and the legal responsibilities of state and federal agencies.

What CEE Is Doing About This Problem

Q: Why is CEE calling for mandatory use of the TED?

A: Because expensive efforts to promote voluntary use of the TED have not succeeded. The TED provides a technological solution to the problem of incidental capture and drowning of sea turtles in the southeastern shrimp fishery. Although the TED offers a shrimp fisherman several benefits, these benefits are apparently not perceived as significant enough to induce shrimp fishermen to use the TED voluntarily.

Despite hundreds of thousands of dollars in federal endangered species funding and several years of promoting the TED, less than one percent of the 6,400 shrimp vessels and 7,600 commercial shrimp boats in the southeastern U.S. are using the TED at any time. Even shrimp fishermen's organizations refuse to commit their members to use of the TED. CEE has concluded that the TED will be



Since 1978, the number of adult female Kemp's ridley sea turtles has declined 27 percent despite intensive conservation efforts. Extinction is inevitable if this trend is allowed to continue.

used only if its use is required by state and federal regulations.

The TED *must* be used if the continuing decline of the Kemp's ridley sea turtle, in particular, and the tremendous wastage of finfish in the Gulf shrimp fishery especially are to be reversed.

Q: When and where should TEDs be used?

A: The TED should be used at all times in state and federal waters from North Carolina to Texas. Some people have suggested requiring use of the TED only in areas where sea turtles seem to congregate. Unfortunately, such information is not available. Furthermore, animals migrating *between* areas of concentration (such as adult female Kemp's ridleys) would still be exposed to capture.

Q: Will these regulations be burdensome to the industry?

A: No. The TED provides several benefits, mentioned above, that will counterbalance any negative economic effects upon a shrimper or the shrimp fishing fleet. Neither the costs nor benefits of the TED are likely to significantly influence the economics of either an individual fisherman or the industry. For example, buying four \$400 TEDs would increase the total operating expenses of the average commercial vessel by less than one percent over the two-year life of a TED. The economic condition of the shrimp fleet is much more heavily influenced by the availability of cheap imported shrimp of high quality, prices set by shrimp processors, fuel costs, insurance premiums, and imprudent investment decisions made in the past.

Also, most observers, including NMFS, believe that the economic well-being of individual shrimp fishermen and the industry as a whole is undercut by the large number of fishermen participating in the fishery.

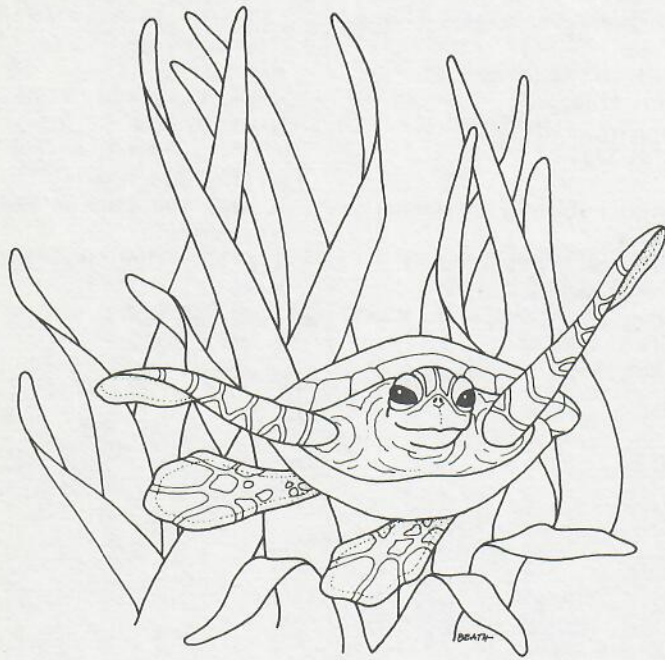
Q: Are TEDs being used anywhere now?

A: Yes. Since 1982, the Indonesian government has required that TEDs be used by Japanese shrimp trawlers fishing in Indonesian waters. As a result, more than 1,000 TEDs are being used there now. In response to numerous requests, NMFS has provided field demonstrations or information about the TED to several countries, including Mexico, Malaysia, Panama, Honduras, and Australia.

For More Information

Q: How can I get additional information about this issue?

A: Contact Michael Weber at CEE (202/737-3600). For information on activities of the National Marine Fisheries Service, contact Chuck Oravetz in St. Petersburg, Florida (813/893-3366). For information on the activities of the U.S. Fish and Wildlife Service, contact Jack Woody (505/766-8062) in Albuquerque, New Mexico.



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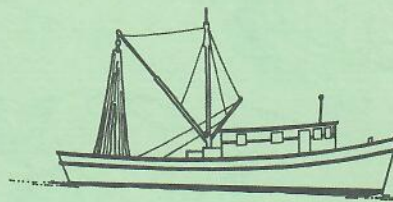
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ADDITIONS

After the August 1986 publication of "Sea Turtles and Shrimp Trawlers," we obtained revised estimates of the number of sea turtles captured and drowned in the southeastern shrimp fishery. Also, the "Georgia jumper" and the Texas TED were tested in August in the Canaveral Channel, Florida. The results have not been analyzed. The revised capture and mortality estimates follow:

Species	CAPTURE			MORTALITY		
	So. Atl.	Gulf	Total	So. Atl.	Gulf	Total
Loggerhead	32,120	10,789	42,909	6,745	3,129	9,874
Kemp's ridley	1,268	1,726	2,994	266	501	767
Green	493	432	925	104	125	229
Hawksbill	70	432	502	15	125	140
Leatherback	211	432	643	44	125	169
TOTAL	34,162	13,811	47,973	7,174	4,005	11,179

U.S. Assessment of the Mortality of Sea Turtles in the Southeastern Shrimp Fishery, 1973

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4. National Marine Fisheries Service, U.S. Dept. of Commerce, *Construction and Installation Instructions for the Trawling Efficiency Device* (NOAA Tech. Memo., NMFS-SEFC-71, June 1985) 22 pp.*

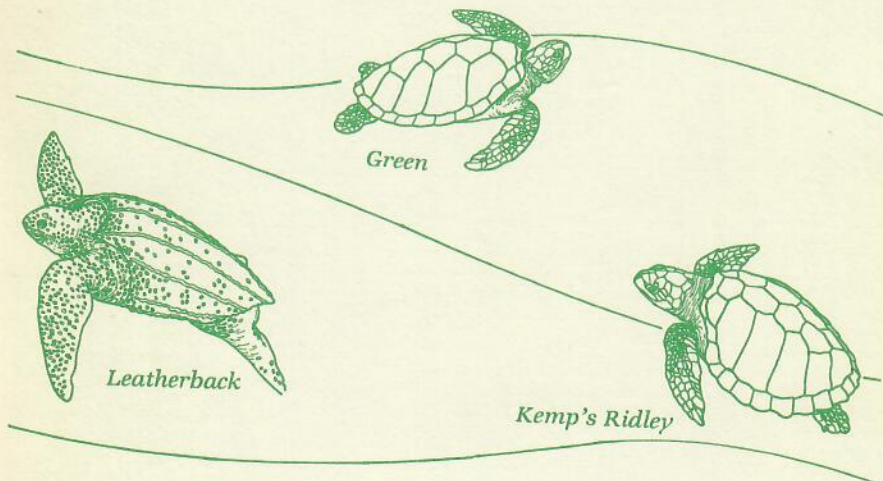
5. National Marine Fisheries Service, U.S. Dept. of Commerce, *Five-year Status Reviews of Sea Turtles Listed Under the Endangered Species Act of 1973* (1985) 99 pp.*

6. Southeast Fisheries Center, National Marine Fisheries Service, U.S. Dept. of Commerce, *A Manual on Sea Turtle Conservation and Research Techniques for Use in the Caribbean and Western Atlantic* (1983) 126 pp.

7. Smithsonian Institution, *Biology and Conservation of Sea Turtles*, (K. Bjorndal, ed., 1981) 583 pp.

8. Gulf of Mexico Fishery Management Council, *Fishery Management Plan for the Shrimp Fishery off the Gulf of Mexico, United States Waters* 259 pp.

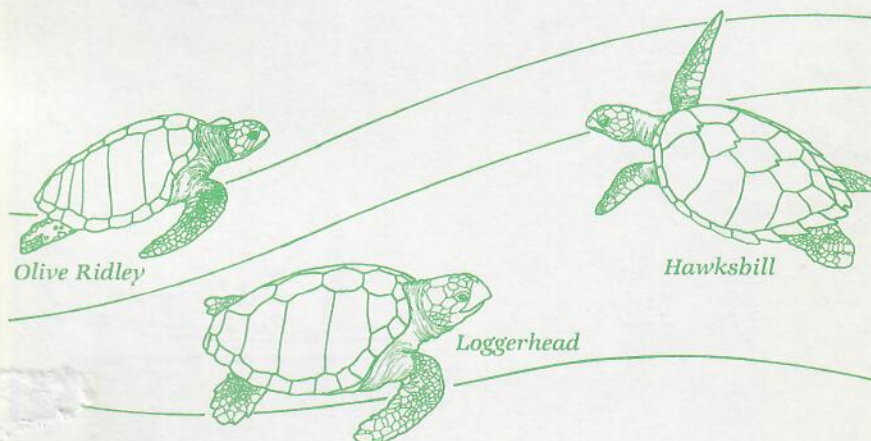
9. Keiser, *The Incidental Catch from Commercial Shrimp Trawlers of the South Atlantic States* (1977) 38 pp.*



For Further Reading

Copies of many of the materials listed below are available from the appropriate government agency. Copies of those materials followed by an asterisk may be obtained from CEE for the price of copying. To determine the price of copying, multiply the number of pages by eight cents. Make all checks payable to the Center for Environmental Education.

1. National Marine Fisheries Service, U.S. Dept. of Commerce, *Final Environmental Impact Statement Listing and Protecting the Green Sea Turtle (*Chelonia mydas*), Loggerhead Sea Turtle (*Caretta caretta*), Pacific Ridley Sea Turtle (*Lepidochelys olivacea*) Under the Endangered Species Act of 1973* (1978) 144 pp.*
2. National Marine Fisheries Service, U.S. Dept. of Commerce, *Environmental Assessment of a Program to Reduce the Incidental Take of Turtles by the Commercial Shrimp Fishery in the Southeastern U.S.* (1983) 14 pp.*
3. Protected Species Program, Southeast Fisheries Center, National Marine Fisheries Service, U.S. Dept. of Commerce, *Annual Report FY 85, Trawling Efficiency Device Project* (1985) 7 pp.*





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