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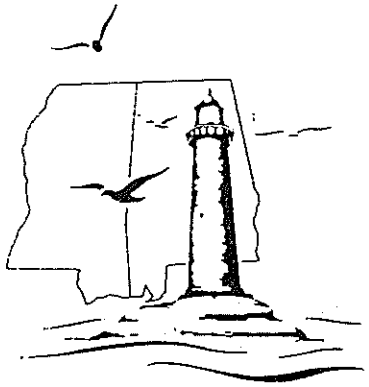

SPECIAL ISSUE: THE TED CONTROVERSY

Turtles, Trawlers, and TEDs: What Happens When the Endangered Species Act Conflicts with Fishermen's Interests

With replies by Tee John Mialjevich of the Concerned Shrimpers of America and Michael Weber of the Center for Environmental Education

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TURTLES, TRAWLERS, AND TEDS: WHAT HAPPENS WHEN THE ENDANGERED SPECIES ACT CONFLICTS WITH FISHERMEN'S INTERESTS

by
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I. INTRODUCTION

During the past year, the normally placid Gulf of Mexico and South Atlantic shrimp fisheries erupted in controversy. The occasion was the imposition of a rule by an agency of the United States government that will require most commercial shrimp fishermen in the Southeast to install a "turtle excluder device" (TED) specifically designed to eject sea turtles overtaken by trawl nets. The rule is at least partly a result of pressure from environmentalists concerned about turtle mortality in shrimp fishermen's nets. Federal law classifies several of the affected turtle species as endangered, requiring protection to the maximum degree feasible.

Although the final rule evolved from the compromises made within a panel of negotiators who represented both the shrimp industry and the environmental community, a large number of shrimp fishermen have expressed strong objections to the outcome of the negotiations and to the rule that resulted. In an effort to dramatize their displeasure, some have vowed civil disobedience, placing their livelihoods at risk.

This article summarizes the nature of the controversy and how it evolved, but takes no sides in the dispute other than advocating the need to uphold and enforce the law. It explains the source of the rule in the federal Endangered Species Act, and how it was adopted through negotiated rulemaking, an experimental development in administrative law that some believe enhances legitimacy of a rule. It outlines the development of TED technology, and traces the events of 1986 and 1987 that led to formulation of the final rule requiring use of the device.

The article will also list objections that shrimp fishermen have raised, and will balance each in turn against the public interest as if it had been raised in a court of law. Finally, it will discuss the nature of the burden that the rule places on shrimp fishermen, and explore possible legal consequences of resisting that rule. It will conclude that the final rule, while undoubtedly placing a burden on shrimp fishermen, is an inevitable consequence of policy choices that the American people, through their elected representatives, made when the Endangered Species Act was enacted in 1973.

II. OVERVIEW OF THE GULF AND SOUTH ATLANTIC SHRIMP FISHERIES

It is hard to generalize about the offshore shrimp fishery of the United States, except perhaps to point out that it is one of our most important food-producing industries. In dollar value of catch landed, it is the nation's most valuable fishery, far ahead of both the salmon and crab fisheries, the nation's second and third in value.

A. Scope of the Shrimp Fishery

Some figures from the 1986 shrimp catch may help provide perspective. More than three-quarters of the nationwide catch of 400 million pounds (valued at $663 million) came from the Gulf of Mexico. And more than two-thirds of

the entire U.S. shrimp catch was landed in Louisiana or Texas, the two leading states in shrimp production. (Oregon and Florida followed, in third and fourth place respectively.)

Nearly all warm-water shrimp taken from U.S. waters are caught along the coastline that extends from North Carolina to the Mexican border of Texas. But some shrimp are taken far offshore; others are caught in nearshore coastal waters or in estuaries. For statistical purposes, location of catch is divided into nearshore waters (0-3 miles from the coast), and farshore waters (3-200 miles). U.S. fishermen do not take shrimp in commercial quantities from international waters beyond the 200-mile limit of the Exclusive Economic Zone of the United States.

Seaward distance of primary catch varies with location along the coastline. In Texas, for example, more than 75 percent of shrimp landings from the years 1980-1984 came from waters more than three miles offshore, while in neighboring Louisiana the opposite situation prevails—59 percent of the landings during the same period were taken from nearshore waters. The shrimp fisheries of Georgia and Florida resemble those of Texas in that the shrimp are caught far offshore, while North and South Carolina, Alabama, and Mississippi catch their shrimp close to shore, like Louisiana. Quantity of catch in any year is heavily dependent upon differences in water temperature and salinity during critical periods of a previous year when juvenile shrimp were growing in estuaries.

B. Shrimp, Shrimpers, and Gear

Shrimp are crustaceans, like crabs and lobsters. They are detritus feeders or predators, depending upon the phase of their life cycle. The three most widely harvested varieties of warm-water shrimp are migratory, dependent upon estuaries for part of their life cycle. Adults spawn in the open sea, and the eggs hatch into free-swimming larvae, which pass through a series of molts. In the postlarval stage a juvenile shrimp enters an estuary to feed on bottom detritus of algae. As juvenile shrimp grow, they migrate back to deeper water, and become more predacious in their feeding habits.

Three varieties account for nearly all the catch. Brown shrimp are the most commonly caught, taken from deeper waters, up to about 50 fathoms. Catch is greatest along the coasts of Mississippi, Louisiana, and Texas. The season on this variety peaks in the early summer months, and gradually declines thereafter to an April minimum.

The second largest component of the shrimp catch is white shrimp, generally caught in water of less than 15 fathoms. Although most white shrimp are taken in an area extending from the mouth of the Mississippi River to Freeport, Texas, a substantial fishery exists also in the South Atlantic. The season runs from August through December, peaking in October, with a short-lived secondary season that peaks in May.

A third variety, pink shrimp, is taken in Gulf Coast waters up to 25 fathoms, but are concentrated most heavily in waters off southwestern Florida. Pink shrimp are best caught between October and May. Brown and pink shrimp are taken mostly during night trawls, and white shrimp mostly by day.

Three other highly prized varieties—royal red shrimp, seabobs, and rock shrimp—are taken from the Gulf and South Atlantic. They are not estuary-dependent, and spend their entire life-cycles in open water. A small directed fishery exists for the deep-sea royal reds, but the others are taken only as incidental catch. The fisheries on all six species are managed under management plans

produced by the Gulf of Mexico Fishery Management Council and its South Atlantic counterpart, under provisions of the Magnuson Fishery Conservation and Management Act, 16 U.S.C. §§1801-1882.

User groups are divided among a large number of commercial vessels, a larger number of recreational shrimpers who fish from boats in estuarine or offshore waters, and an unknown number who fish inshore waters for live bait. In 1983, more than 14,000 commercial and recreational vessels were active in U.S. waters of the South Atlantic, and more than 11,000 in the Gulf. In general, the Gulf fishery uses larger vessels and fishes for longer periods—often as much as two or three weeks.

There are about 30,000 shrimp fishermen nationwide, and many times that number employed in processing and marketing. The harvesters are a diverse group, not easily classified by any characteristic (except perhaps persistence and determination). Certain social groupings, however, can be identified. There are commercial fishermen and sport fishermen, and there are long-established shrimpers such as Cajuns, Islenos, and those of Spanish or Yugoslavian extraction, and recent immigrants, such as the Vietnamese, who became active in the Gulf shrimp fishery in the 1970s. They do not always get along well together.

Commercial shrimp vessels most often fish with an otter trawl, a heavy mesh net with wings on each side to funnel shrimp into the net. heavy otter boards (or trawl doors) at the end of each wing provide the drag needed to spread the net. Double-rig trawls (one on each side of the boat) have become common, and recently twin-nets have found favor among fishermen. A shrimp vessel will most often pull two or four twin-nets (i.e., four or eight trawls) from outriggers on the boat. Nets are dragged a few inches above the ocean bottom. Typically 15 feet high and 40 feet across, the net funnels the catch into the bag or cod-end. Customary trawl times run between two and six hours.

Adult shrimp are not free-swimmers, but rather are benthic (bottom) animals. At the approach of a net (particularly if it has leaded lines or tickler chains designed to stir up the mud bottom), a shrimp will leap off the bottom and be swept into the trawl. After a certain amount of time the net is hauled aboard, and the contents of the cod-end dumped onto the deck or into the hold. The catch will typically include a large quantity of finfish, and also various kinds of jellyfish and net-clogging debris. And sometimes the net contains a sea turtle which may have been captured, towed for several hours, and drowned.

III. MARINE TURTLES OF THE SOUTH ATLANTIC AND GULF OF MEXICO

Sea turtles are among the few varieties of reptiles that are wholly marine. Evolution has modified their forelegs into flippers, and the animals are almost helpless out of water. Their only contact with land occurs at the moment of hatching, when the hatchlings scramble seaward immediately upon escaping the eggshell, or when an adult female crawls ashore to lay her eggs. Seven species occur worldwide, and five of them are found in Gulf and South Atlantic waters where U.S. shrimp fishermen spread their nets. They are the loggerhead, the hawksbill, the green, the leatherback, and the Kemp's ridley. All are air-breathers that can hold their breaths for long periods of time.

A. Natural History

Leatherbacks are the largest, with an average weight of 1000 pounds and length of five feet. Kemp's ridleys are the smallest, with an adult weight of less

than 100 pounds and a shell length of 26 inches. Diet differs for each species. Leatherbacks prefer jellyfish, and Kemp's ridleys eat mostly crabs. (The Kemp's ridley is often seen in inshore waters because of its feeding habits, and has even been observed in freshwater lakes with a connection to the sea.) Loggerheads like shellfish such as clams and mussels. Hawksbill turtles are omnivorous, eating anything from sea grasses to lobsters, and green turtles eat mostly sea grasses.

In all species the gravid female must return to land to lay and bury her eggs. Loggerhead turtles nest widely along the southeastern coast of the U.S., and a few green turtles and leatherbacks nest on the east coast of Florida. The others do not nest on the U.S. mainland. The Kemp's ridley is unique in that it has been found to nest naturally only along a 20-mile stretch of the east coast of Mexico, about 110 miles south of Brownsville, Texas in the state of Tamaulipas. It crawls out of the sea only during daylight hours, rendering it intensely vulnerable to predation.

B. Turtle and Finfish Mortality in Shrimp Nets

Sea turtle mortality has been linked to a variety of causes. Among the most important are loss of nesting sites to coastal development, activities associated with offshore energy development, changes in climatic conditions, pollution, ingestion of marine debris, intense predation of eggs and hatchlings on nesting beaches, illegal capture for human consumption, and incidental capture in fishing gear.

It is not known to what degree any of these causes predominates. It is, however, known from direct observation and interviews that many turtles are captured and drowned in nets drawn by shrimp trawlers—particularly the slow-moving loggerheads and the Kemp's ridley, the latter of which feeds in areas that are also rich shrimping grounds. (Leatherbacks are rare, and not often caught; Hawksbills live among coral reefs, which shrimpers take pains to avoid, and the green turtle, with its powerful flippers, can outswim an approaching net.)

When a turtle sees trawl doors approaching, it will try to outswim the trailing net. It will not attempt escape by veering off to the side. A loggerhead can swim at speeds of 20 miles per hour, while the net creeps along at four. But eventually the turtle, in its single-minded determination to outswim the net, will tire, and be caught. Pinned to the webbing, the animal cannot surface for air, and will drown if the tow time exceeds its diving capacity of about 90 minutes.

Inferences drawn from tag return data support the conclusion that many turtles die in shrimp trawls. Although precise quantification is difficult, 27,578 observer hours spent on offshore commercial shrimp trawlers have documented the capture of 884 sea turtles. The National Marine Fisheries Service (hereafter NMFS) estimates that more than 47,973 sea turtles are captured annually in United States offshore waters in commercial shrimp trawls. More than 11,179 die as a result. (No estimates of capture or mortality are available for sea turtles taken inshore.)

Data collected from the Sea Turtle Stranding and Salvage Network also support the conclusion that shrimp nets are an important cause of sea turtle deaths. Since 1980 the volunteer network has reported to NMFS the number of stranded turtles seen on the coasts of the Gulf and South Atlantic. As of early 1987, the Network has reported more than 8,300 dead turtles, almost 600 of which were the critically endangered Kemp's ridley. Although it is rarely possible to establish with certainty the cause of death of a turtle found stranded on a

beach, in many places it has been noted that peaks in turtle strandings coincide with peaks in shrimping efforts.

Shrimp nets also capture large numbers of finfish, most of which are shoveled dead over the side. (Finfish bycatch in shrimp trawls is another potentially volatile issue, and some shrimpers believe that environmentalists and sport fishermen are holding it in reserve until the TED battle is over. *National Fishermen*, Jan. 1988 at 10.) Shrimp vessels are highly specialized operations, and few shrimpers are equipped to market finfish bycatch. Most view them as undesirable catch. In 1983 the Southeast Fisheries Center reported that shrimpers of the Gulf and South Atlantic catch and discard more than 900,000 metric tons of groundfish every year. A 1985 estimate puts finfish bycatch in the northern Gulf alone at 510,000 metric tons annually. A 1975 study estimates that between four and twelve pounds of finfish are caught for every pound of shrimp harvested. As much as 70 percent of this finfish discard is marketable. Some shrimpers report that they are seeking markets for this bycatch, although many simply don't want to be bothered.

IV. THE ENDANGERED SPECIES ACT

The Endangered Species Act of 1973 (hereafter ESA), 16 U.S.C. §§1531-1543, reflects Congressional findings that human activities are responsible for causing the extinction of many species of animals and plants, and are bringing many more to the brink of extinction. The Act was enacted to prevent or retard the number of extinctions from man-made causes. It directs agencies of the federal government to use all methods at their disposal—regardless of cost—to prevent human-caused loss of animals and plants classified as endangered species.

The ESA is a tough and expensive law. It has no provisions for economic considerations and it allows for only a few very limited exemptions to its provisions. It attaches the highest importance to preservation of endangered animals and plants. Over and over again, courts and the Congress have confirmed this strict interpretation of the law, and have rejected any balancing test that might bring economic considerations into the equation. See, e.g., the famous "snail darter" case, *Tennessee Valley Authority v. Hill*, 435 U.S. 153 (1978). Courts, moreover, have found that federal agencies must do far more than merely guard against the extinction of protected species. They have an affirmative duty to increase their population, to bring them back from the brink of extinction, and to use all methods necessary to do so. See, e.g., *Defenders of Wildlife v. Andrus*, 428 F. Supp. 167 (D.D.C. 1976) at 170.

A. Provisions

The ESA creates two categories of species in peril of biological extinction. It defines an "endangered" species as one which is in danger of extinction throughout all or a significant portion of its range. A "threatened" species is one which without protection is likely to become endangered in the future. Determination of a species' status and strategies for its preservation must be based upon the best available scientific knowledge. Candidates for protection are proposed by a governmental committee, most often after recommendation by scientists or environmentalists. Final determination of whether a species qualifies for federal protection is made either by the Secretary of Commerce, acting through NMFS, or by the Secretary of the Interior, acting through the Fish and Wildlife Service. The former's authority extends to marine species; the latter's to non-marine species.

The listing process begins with a petition, usually submitted by scientists from professional biological assocations such as the American Fisheries Society or the American Ornithological Union. A decision on the merit of the petition must be made within 90 days. If the preliminary decision is favorable, the agency begins its own review of the status of the species in question. The review must be completed within one year of the receipt of the original petition, and findings published in the *Federal Register.*

If protection is found to be warranted, the next step is to develop a proposed regulation, which must be published in the *Federal Register.* Opportunity for public comment must be provided. A final regulation must follow within one year, or the proposed regulation may be withdrawn, with publication of findings on which the withdrawal is based. An extension up to six months may be granted where substantial disagreement exists about the accuracy or sufficiency of available data.

A species proposed for protection is then categorized according to a priority system, explained in 48 *Fed. Reg.* 43,098-43,105 (1983). The priority rating determines the candidate species' place on the list. The list is not restricted to animals and plants naturally occuring in the U.S., but is worldwide in scope. Out of 2,000-3,000 proposals, some 50 to 70 species are accepted for inclusion on the list each year. This figure is primarily the result of financial limitations. Funding to maintain and revise the list currently stands at $3.2 million a year, and according to a Fish and Wildlife Service estimate, it costs about $62,000 to qualify a candidate species for protection. The list itself is published at 50 CFR §17.11.

A species alloted a place on the list is protected from "taking" within the United States, its territorial sea, or upon the high seas by U.S. citizens. "Taking" includes possession, harrassment, harm, pursuit, capture, sale or offer of sale, delivery, transport or shipment. Export and import of protected species are prohibited. Civil penalties may range from $500 to $10,000 for each violation, and criminal penalties may include fines of up to $20,000, forfeiture of equipment and vehicles or vessels, and a year in prison. 16 U.S.C. §1540 (a), (b).

Lack of intent is no defense, so that incidental capture of a protected species is a punishable taking, unless one has an exemption. Four categories of exemptions from the prohibitions of the ESA exist, two of them relevant to sea turtles. "Experimental populations" authorized for release outside a species' current range may be exempt from the "taking" prohibition of the ESA. More importantly for the shrimp industry, "incidental" takings may be exempted under some circumstances. 16 U.S.C. §1539(a)(1)(b).

One who seeks an exemption for incidental catch of a protected species must apply to the Fish and Wildlife Service or to NMFS for a permit. 16 U.S.C. §1539(a)(2). In the past, commercial shrimp fishermen likely to catch endangered or threatened sea turtles have been granted permits, on condition that the animal is released unharmed, or an attempt is made to revive it. This rule applies to all sea turtles caught in trawl nets, whether listed as "endangered" or "threatened."

An important feature of the ESA is its citizen suit provision. With this feature the ESA can be enforced not only by the government, but also by any private citizen or organization. A citizen may sue the government to force action, or he may sue a violator. The Act authorizes a private party to bring suit for enforcement, provided that 60 days notice is first given to the Secretary and to the alleged violator. 16 U.S.C. §1540(g).

B. Sea Turtles Listed

The ESA protects all five species of sea turtles found in the South Atlantic or the Gulf of Mexico adjacent to the U.S. coast. Species listed as endangered include the Kemp's ridley, the leatherback, the hawksbill, and some populations of green sea turtles; those listed as threatened include the loggerhead turtle and all other populations of green sea turtles. According to NMFS estimates, loggerhead deaths in U.S. waters as a result of capture in shrimp nets total 9,874 a year; Kemp's ridley 767 a year; and green turtles about 300 annually. The Kemp's ridley is considered critically endangered; numbers have declined from more than 47,000 nesting females observed in Mexico during the 1947 *arribada* (nesting aggregation) to only 542 nesting females reported last year. Despite protected nesting grounds, the population of nesting females has been declining three percent a year for the last ten years.

C. "Reauthorization" of the Act

The ESA provides for periodic review by Congress, a process called "reauthorization." The last Congressional authorization expired in September, 1985. Partly because of controversies over protection afforded sea otters, grizzly bears, red wolves, and most recently sea turtles, Congress has not yet reauthorized the Act. (The current authorization bills, H.R. 1467 and S. 675 to appropriate funds for FY1988-1992, are at this writing still in committee. Proponents of reauthorization seem reluctant to push at this time, possibly for strategic reasons associated with the furor over TEDs.) Instead Congress has annually "extended" its provisions with interim funding.

A common misconception is that a federal law that fails to be reauthorized when scheduled is not enforceable. This view is not correct. Unless a law has built-in "sunset" provisions (i.e. automatic expiration), reauthorization is only a formal review. So long as Congress continues to appropriate funds for implementation and enforcement, the law is not in abeyance. In fact, even if Congress failed totally to provide interim funds, the ESA, as we have seen, is enforceable by private parties because of the citizen suit provision.

A law up for reauthorization is vulnerable, however, and subject to amendment or funding reduction. Coincidentally, Congress was considering amending the ESA at almost the same time that angry shrimpers were presenting their case. Although shrimpers complaining about the TED rule received a more sympathetic hearing than they might otherwise have gotten, at this writing only one bill amending the ESA, H.R. 1658, has been introduced. It will be discussed more fully below.

V. THE DEVELOPMENT OF TURTLE EXCLUDER DEVICES

Until a few years ago, large numbers of sea turtle drownings were an unavoidable though unintended consequence of shrimp trawling. The only alternatives under the ESA were these: (1) limit or shut down the shrimp fishery—an economically traumatic and politically unacceptable course of action that would increase consumers' reliance on shrimp imported from other countries, some of which might also be caught at the expense of endangered turtle populations; (2) establish a quota system such as what now exists for incidental porpoise catch in the tuna fishery—a course of action that would require an expensive program for placing federal observers on shrimp vessels; or (3) do nothing except require fishermen to release incidentally caught turtles as speedily and solicitously as possible.

Not surprisingly, NMFS chose the last alternative. The agency issued a Final Environmental Impact Statement on the subject of incidental turtle capture in 1978. At the same time it distributed to shrimpers guidelines for resuscitating and releasing captured turtles.

But beginning that same year, gear research programs under the auspices of NMFS, Sea Grant, and the shrimp industry itself led to the development of several types of net installations that came to be called Turtle Excluder Devices (TEDs). A successful prototype device was developed by 1981, and in ensuing years the devices became smaller, lighter, and collapsible for easy handling on deck. By 1983, 200 TEDs built by a government contractor were available for distribution (most of them free) to shrimpers of South Carolina, Georgia, and Florida. Between 1978 and 1984, NMFS spent $3.4 million on the TED research program.

The prototype TED is a cage-like device installed in front of the bag or cod-end of a trawl net. Large objects entering the net encounter bars that slant upward at a 45-degree angle. The bars force the object through a trap door and out the net. Small objects like shrimp pass through the bars into the cod-end, and finfish are able to escape through hatches at each side of the TED. This version weighs about 37 pounds and costs about $400 for both materials and labor. NMFS expects existing TED designs to prevent capture and consequent drowning of 97 percent of sea turtles overtaken by shrimp nets, yet without significant reduction of shrimp catch. Reduction in finfish catch of up to 78 percent for daylight trawls and 53 percent for night trawls has also been achieved. (Watson, 1985.)

In 1983, when NMFS and the environmental community became convinced of the value of TEDs in reducing turtle mortality, NMFS began a formal program to encourage shrimp fishermen to place them in their nets voluntarily. The agency distributed devices to shrimpers who agreed to use them. In theory, the gear would reduce the weight of bycatch in the bag, thereby allowing the trawl arms to spread more widely for a longer period of time. This, it was believed, would increase shrimp catch. In an attempt to enhance their appeal to fishermen, NMFS began to call TEDs "Trawl Efficiency Devices."

Although the basic TED design is merely an adaptation of the familiar "cannonball shooter," a device long used by a few highliners to rid shrimp nets of natural and manmade detritus—particularly the bothersome "cannonball" jellyfish—few shrimp fishermen responded. Most remained unconvinced that the devices provided sufficient economic incentive in the form of catch purity. And virtually all viewed the devices as unduly burdensome. Even the state of Georgia, when it offered $80,000 in fuel rebates to shrimpers who agreed to use TEDs it had for distribution, failed to attract much interest. By the end of 1986, fewer than three percent of active shrimp trawlers had tried the device.

The original TED prototype was indeed bulky and arguably unsafe; its rigidity, size and weight effectively restricted its use to vessels longer than forty feet. The device's poor reputation among shrimpers tainted subsequent models and their prospects for widespread use. But NMFS modified the original design, and conducted some 14,000 hours of tests. Several private vendors developed their own versions as well.

The models approved at this writing are called the modified NMFS TED, the Georgia Jumper, the Cameron TED, and the Matagorda TED—the latter

two developed with Sea Grant support. A fifth design—called the Mississippi Hybrid—was certified last April, though it has not at this writing been tested in the water. A sixth version, called the Morrison soft TED, made of mesh instead of rigid tubing, was successfully tested by University of Georgia Sea Grant scientists in June, and was certified in the fall of 1987. 52 *Fed. Reg.* 37,152-37,154 (Oct. 5, 1987). NMFS has developed and approved another version—a "mini-model"—for use on smaller inshore shrimp vessels. Although TED preference will vary with local conditions and season, early reports show fishermen favoring the Georgia Jumper model, the simplest and cheapest version, and one which many fishermen already own.

NMFS has developed a procedure for testing other designs and submitting them for qualification. Tests are performed under NMFS supervision, normally off Cape Canaveral, Florida, where turtle concentrations are high. A device qualifies if it excludes 97 percent of the turtles found in the area where intended for use, as determined by NMFS testing. A certified TED must be large enough to free a turtle of 32 inches curved carapace width (35 inches in the South Atlantic), and must also exclude juvenile turtles as small as six inches across (linear width).

VI. THE TED NEGOTIATIONS AND THEIR AFTERMATH

The confrontation between the shrimp industry and those concerned with the welfare of marine turtles had been building for several years, ever since it became apparent that TEDs were effective in reducing turtle mortality. The first meeting between environmentalists and shrimp industry representatives to promote the use of TEDs occurred in 1982. Aware of the economic importance of the shrimp industry, NMFS officials for a time seemed content with the status quo, preferring to encourage but not require TED use.

This situation changed in 1985, when it became apparent that the voluntary TED program was not working. An environmental organization committed to the survival of sea turtles and the U.S. Fish and Wildlife Service both requested that NMFS adopt regulations requiring the use of TEDs. In the summer of 1986, the same environmental organization served notice upon NMFS of its intent to sue to enforce the provisions of the ESA. The economic interests of the shrimp industry and the requirements of the ESA seemed on a collision course.

A. 1986 Developments

In February, 1986 the regional director of the Fish and Wildlife Service in Atlanta joined turtle advocates in appealing to the Gulf of Mexico Fishery Management Council to require the use of TEDs on all commercial shrimp trawlers operating in the Gulf. In July the Shrimp Committee of the Gulf Council responded, recommending that shrimp vessels be required to use TEDs in certain localities and at certain times of the year. On August 20, the Administrator of the National Oceanic and Atmospheric Administration (NOAA) called a meeting of environmental spokesmen and industry representatives from the Gulf states. Participants were briefed on proposed regulations that would require TEDs when trawling at certain places in Texas, Louisiana, and Florida.

The proposed regulations, however, were acceptable to no one. Industry and environmentalists united in opposition. Two days later, the Center for Environmental Education, a nonprofit organization with headquarters in Washington, D.C., served notice of impending lawsuit on the Secretary of

Commerce. In CEE's view, NMFS and its parent body NOAA, by not mandating the use of best available technology to reduce mortality of endangered and threatened sea turtles, were violating the provisions of the ESA. If the agencies took no steps within 60 days to enforce the Act, the Center would sue. It would demand a closure of the commercial shrimp fishery in U.S. waters of the Gulf and South Atlantic from Texas to North Carolina inclusive—except in those areas shown to be beyond the range of sea turtles. Closure would remain in effect until TEDs were installed on all vessels, protecting turtles from unnecessary capture.

It is a common observation that every party affected by a government regulation tends to think that the responsible agency unduly favors parties with opposing interests. On the TED issue, shrimpers predictably thought that NMFS was overly sympathetic to the cause of the environmentalists. On the other hand, environmentalists thought that political pressures had inclined the agency to be too lenient with the shrimp industry. In circumstances like this where livelihoods compete with regulations protecting endangered species, a government regulation will be entirely satisfactory to no one, and the situation can become politically volatile. It is hardly surprising that an agency might be inclined to seek an alternative procedure.

Dissatisfied with the proposed rule and alarmed over the prospect of a fishery closure, shrimp industry representatives who participated in the NOAA meeting requested mediation. At that point the NOAA Administrator suggested a novel approach. Perhaps surmising that nobody, not even the environmentalists, wanted closure of the shrimp fishery, on August 29 he proposed that instead of devising its own regulation, NMFS would offer the various parties an opportunity to negotiate a rule that would satisfy everyone. He promised to delay the November 1 effective date of the proposed regulation if he were satisfied that the parties would negotiate in good faith.

After a further meeting with the NOAA Administrator, the parties agreed to try. The Administrator invited them to choose their own representatives and send them to the negotiating table. A professional labor mediator from Juneau, Alaska was chosen to mediate. Representatives of the Center for Environmental Education, the Environmental Defense Fund, Greenpeace, and the Monitor International Fund for Animals took the environmentalists' side, and the Texas Shrimp Association, the Southeastern Fisheries Association, the Louisiana Shrimp Association, the Concerned Shrimpers of Louisiana, the South Carolina Shrimpers Association, and the Bryan County (Georgia) Fisheries Co-op represented industry interests. The parties sat down to negotiate. During the closing months of 1986 the negotiators and their mediator met with government officials in New Orleans, Jekyll Island, Georgia, Washington, D.C., and Houston.

Negotiations were heated, with much give-and-take. Environmentalists wanted to require TED use everywhere, in all seasons. Shrimpers wanted no mandatory TEDs at all, but rather offered mandatory tow time limitations so that captured turtles would be less likely to drown. When contentious issues were discussed, some threatened to walk out of the negotiations, but were dissuaded by their colleagues.

The parties eventually agreed on two principles: first, that endangered sea turtles (especially the Kemp's ridley) should be protected by whatever means necessary; and second, that to the greatest extent possible this should be done without adversely affecting the shrimp industry. In practice, this would mean

that TEDs should be 97 percent effective in excluding turtles, but that they would also achieve shrimp retention rates 97 percent of what is possible without their use. Shrimper representatives stressed the importance of efforts other than TED use to reduce turtle mortality. They suggested accelerated construction of hatcheries, and perhaps an official embargo of Mexican shrimp if the Mexican government took no steps to protect endangered sea turtles.

The environmentalists agreed that they would not seek to shut down the fishery if the shrimpers abided by the negotiated rules. They further agreed to a three-year phase-in of the requirements, and to a liberal enforcement policy under which shrimpers in compliance with the rules would not be subject to prosecution, even if sea turtles continue to be captured. Agreement was announced on December 12, and all parties (except for a single abstainer) signed the negotiation agreement. The document called for a TED rule with a three-year phase-in. Eventually all commercial shrimpers would have to install TEDs in specified areas of the South Atlantic and Gulf of Mexico. The formal agreement served as the basis for the proposed regulation, as published in 52 *Fed. Reg.* 6179 (March 2, 1987). In the meantime NMFS prepared a Draft Supplement to the original 1978 Environmental Impact Statement, and issued it in February.

B. Negotiated Rulemaking in Administrative Law

Although not without precedent, the NOAA Administrator's approach represented a novel procedure in administrative law—one that has been called negotiated rulemaking. This use of facilitated face-to-face negotiation to avoid time-consuming and costly litigation in environmental rulemaking is a recent development. Its use has been widely advocated, and the Administrative Conference of the United States has encouraged federal agencies to experiment with negotiated rulemaking. 1 CFR §305.82-4. The process had previously been used with some success by other federal agencies—notably the Environmental Protection Agency—but never by NMFS.

Federal environmental regulations are developed under procedures prescribed by the Administrative Procedure Act of 1946, 5 U.S.C. §§551-559. Ordinarily, the Act requires that federal agencies use notice and comment rulemaking. The agency first uses its own special expertise to develop a proposed rule, and meets informally with parties who will be affected by or interested in it. It then develops a Notice of Proposed Rulemaking, and publishes it in the *Federal Register.* The agency then makes the proposed rule available for formal comment from interested parties, and fine-tunes it accordingly. In some cases, hearings may be held and oral testimony taken on the record before rules are adopted. Although the agency is allowed considerable discretion in formulating it, the final rule must be based on a thorough consideration of the record.

When needed facts are unavailable or in dispute, the agency may choose among disputed facts by making policy choices. When an agency must balance competing interests and conflicting or uncertain facts to develop a rule that has real political or economic consequences, that rule, as we have seen, almost invariably meets with strong opposition.

The Administrative Procedure Act allows some flexibility in rulemaking procedures, provided that opportunity for public comment is assured. It is possible under the law to supplement the notice and comment process with informal negotiations. An agency may well be inclined to defuse a potentially explosive situation by allowing the affected parties to formulate their own mutually agreeable rule.

Critics of negotiated rulemaking have warned of the danger of "deal-making behind closed doors." But strong incentives exist to experiment with the process. A former EPA Administrator estimated that more than 80 percent of EPA's rules wind up in court, and that about 30 percent of the agency's rules are changed as a result. It is arguable that traditional notice and comment rulemaking has become a wasteful process, often resulting in unnecessary litigation. Although notice and comment rulemaking may enhance political legitimacy, it does so by increasing the cost, complexity, and time necessary to implement rules.

When the parties have resolved differences of opinion and made trade-offs necessary to reach consensus, the resulting agreement is reduced to writing and published in the *Federal Register* as the agency's proposed rule. Then the formal review and comment process takes over. Because agreement has already been reached, the hearing and review period is uneventful and prospects of litigation are diminished—in theory.

Thus, negotiated rulemaking ideally results in a rule that has greater legitimacy than what an agency might otherwise have drafted on its own. It works best when the parties chosen to negotiate are truly representative of their constituencies, and have the power to bind them. But without careful selection of representatives, the process can go awry. A constituency may repudiate both their representatives and the agreement when they learn of its unfavorable economic impact. The results of painstaking negotiations may come to naught, and the public review period can be turbulent.

That is, in fact, what happened to the TED agreement of December, 1986. Since negotiated rulemaking is a voluntary procedure that an agency may or may not choose, its benefits must be clearly demonstrated before the agency may be willing to use it again. If the agency gets "burned"—by breakdown of the negotiations, by bad faith of some participants, or by subsequent repudiation of an agreement tediously negotiated—it may be less inclined in the future to allow interested parties to forge their own rules.

C. 1987 Protest

The proposed regulation provided for public hearings to be held during the month of March at various locations in the Southeast and in Washington, D.C. Grudgingly accepted by shrimpers of the Atlantic seaboard and the Florida Gulf, the proposed rule nevertheless turned into the most contentious issue in the history of the shrimp fishery.

Led by an articulate shrimper from Delcambre, Louisiana, who participated in the negotiations but refused to sign the agreement, inshore shrimpers of Louisiana, Mississippi, and Alabama turned out en masse to protest the proposed TED requirement. In what astonished government officials and some industry representatives viewed as a self-destructive position, large numbers of inshore shrimpers vowed that they would not obey the law, that they would forfeit their vessels and go to prison before they would submit.

Recalcitrant shrimpers organized letter-writing campaigns, and mail to Southeastern congressmen reportedly ran ten-to-one against mandatory use of TEDs. Shrimpers showed up en masse at public hearings, and some flew to Washington to give testimony at ESA reauthorization hearings. Government officials were heard to comment that they had never seen more people turn out on any fishery issue—ever.

Public hearings in 16 southeastern locations were held to take testimony. In Thibodaux, Louisiana, the large civic auditorium was filled to capacity with some 5,600 shrimpers, and the state police were called out to control traffic and preserve order. On hand to condemn the devices were a Louisiana Congressman and the Louisiana Attorney General. The Louisiana Governor observed, "Perhaps some species were just meant to disappear," and the audience applauded vigorously. He continued, "If it comes to a question of whether the shrimpers or the turtles are going to be in trouble. . . goodbye turtles."

The 1987 Louisiana Legislative Session passed four concurrent resolutions urging a delay of TED rule implementation or calling for further study. It also passed three laws, two of which (Acts 283 and 891) prohibit state fish and wildlife enforcement officers from enforcing federal TED regulations. A third law (Act 896) authorized $100,000 to create a special office in the Louisiana Department of Justice to take legal action for the purpose of delaying or preventing enforcement of the TED rule.

On April 1, Congressman Bob Livingston (R-LA) introduced H.R. 1898 to defer implementation of regulations until July 15, 1988. Offered as an amendment to a supplemental appropriations bill, the final version passed by Congress delayed implementation until September 30, 1987. In the meantime, Senator John Breaux (D-LA) attempted to structure a compromise whereby TEDs not shown to be 97 percent effective in shrimp retention would not be required, and alternate conservation techniques would be sought. His efforts were not successful. In November, 1987, Congressman Billy Tauzin (D-LA) announced that he would try to attach an amendment delaying mandatory TED use for a year to the ESA reauthorization bill currently under consideration.

At similar public meetings in Mississippi and elsewhere people were turned back at the door for lack of space. About 1,200 shrimpers attended the public hearing in Biloxi to hear the Mississippi Governor and Attorney General call for a one-year moratorium on implementation of the regulation. A Mississippi state senator announced his intention of introducing a bill in the state legislature to make the use of TEDs in state waters a crime.

Because of this intense grassroots pressure, some industry representatives who signed the mediation agreement later withdrew their support. The Shrimp Associations of both Louisiana and Texas repudiated the agreement.

D. The Final Rule

NMFS received thousands of comments—both written and oral—before the review period closed in May. Fishermen and environmentalists predictably accounted for most of the submitted comments. But contributions were received also from the Governors' and Attorney Generals' offices of several southern states, and also from U.S. Congressmen. Although the original participants were no longer a formal negotiating committee, NMFS sought their views on changes in the proposed rule and the wording of the final rule.

The final rule, published at 52 *Fed. Reg.* 24,244-24,262 (June 29, 1987, to be codified at 50 CFR Parts 217, 222, and 227), reflects a considerable degree of compromise. It differs from the proposed rule in several important ways. The starting date from implementation was delayed. Phase-in of the rule is now scheduled to begin January 1, 1988 (October 1, 1987 for the Canaveral channel). But differences exist also in the areas where TEDs will be required, in which trawlers must use them, and in the imposition of tow time restrictions.

The final regulation enlarges the fishing areas and seasons covered, but drops TED requirements for vessels fishing within "inshore waters"—generally, in bays or sounds such as Mobile Bay that lie under state jurisdiction—provided that vessels restrict total tow time to 90 minutes or less. (NMFS scientists have determined that tows of 90 minutes or less, measured from set to retrieval, with a typical bottom time of 60-75 minutes, will cause negligible turtle mortality because of the animal's capacity for holding its breath that long.)

The tow time limitation may be ignored if a qualified TED is used. Also, vessels under 25 feet in length are exempted from the TED requirement in offshore waters, provided the tow time limitation is observed where and when larger vessels are required to use TEDs. The 10-fathom contour boundary proposed for the Gulf was dropped because of anticipated enforcement difficulties. Instead, the regulations will apply to Gulf waters out to 15 nautical miles from shore for the first year, and all waters out to the 200 mile boundary of the EEZ thereafter. An amendment published in 52 *Fed. Reg.* 37,152-37,154 (Oct. 5, 1987) clarified the distinction between inshore and offshore waters.

By 1990, according to a NMFS estimate, more than 17,200 vessels of the U.S. shrimp fleet will be subject to the mandatory TED rule.

Summary of Final Turtle Protection Regulations

Areas	Vessel size	Requirement	Season	Start	Coverage
Offshore:					
Canaveral area	≥25 ft	TED	All year	10-1-87	All waters
Atlantic area	"	TED	May 1 to August 31	05-1-88	"
Southwest Florida area	"	TED	All year	01-1-88	Shore to 15 miles[1]
Gulf area	"	TED	March 1 to November 30	03-1-88	Shore to 15 miles[2]
Canaveral area	<25 ft	90 minute tow[3]	All year	10-1-87	All waters
Atlantic area	"	"	May 1 to August 31	05-1-88	"
Southwest Florida area	"	"	All year	01-1-88	Shore to 15 miles[1]
Gulf area	"	"	March 1 to November 30	03-1-88	Shore to 15 miles[2]
Inshore:					
Canaveral area	All	90 minute tow[3]	All year	10-1-87	
Atlantic area	All	"	May 1 to August 31	05-1-88	
Southwest Florida area	All	"	All year	01-1-88	
Gulf area	All	"	March 1 to November 30	03-1-88	

[1]Will extend to all waters 1-1-89.
[2]Will extend to all waters 3-1-89.
[3]Tow time restrictions do not apply to shrimp trawlers that are using a TED in each net during trawling.

This table adopted from 52 Fed. Reg. 24,248 (1987).

E. A Court Challenge?

In August, 1987, the Attorney General of North Carolina petitioned NMFS to withdraw those parts of the final regulations that pertain to North Carolina waters not included in the original proposed regulations. Arguing that the addition of these waters constituted an abuse of agency discretion, the Attorney General threatened to file suit in U.S. District Court if the disputed sections were not repealed. (In fact, North Carolina was the only state affected that lacked a representative at the TED rule negotiations.) In October, 1987, NMFS agreed to withdraw the disputed sections applicable to North Carolina, but at this writing the agency has not yet formally published its repeal.

In November, 1987, the State of Louisiana filed suit in U.S. District Court seeking an injunction against enforcement of the final TED regulation. The Attorney General offices in Texas and Alabama have each expressed interest in joining the Louisiana suit. Louisiana alleges that the rule is arbitrary and capricious because the TED testing procedures and locations took no account of special conditions that exist in each state. The State further alleges that the TED regulations are arbitrary and capricious, and unsupported by the record because (1) TEDs were not tested in Louisiana waters prior to imposition of the rule; (2) NMFS has not proved that endangered turtles occur in Louisiana waters in numbers great enough to justify the regulations; (3) the regulations are overly broad, and were not adopted in accordance with procedures required by the Administrative Procedures Act, and alternatives were not adequately considered; and (4) the regulations violate shrimpers' constitutional right to equal protection and due process of law.

The Concerned Shrimpers of America, a group formed in August, 1987 to protest the rule, has indicated that it will seek to join in the suit brought by the State of Louisiana, demanding a short-tow exemption for farshore as well as nearshore waters. It has been collecting money for a legal defense fund and has secured an attorney.

Any state or citizen with "standing" (a stake in the outcome) may challenge an agency's rule in court. Statistics are not available for lawsuits filed against NOAA or NMFS, but a former Administrator of EPA, as mentioned above, has disclosed that about 30 percent of court challenges result in a change in his agency's rule. If not necessarily typical of all agencies of the U.S. government, this figure may nevertheless be indicative of chances of success when an aggrieved party challenges an agency rule in federal court.

Ordinarily a court will overturn an agency regulation for only four reasons. (1) if the regulation exceeds the agency's authority; (2) if the regulation is an abuse of the agency's discretion; (3) if the regulation is what the language of the law calls "arbitrary and capricious" (i.e., unsupported by the record); or (4) if the regulation was adopted by improper procedure.

While it is risky to speculate about the outcome of pending litigation against administrative agencies, it is nevertheless correct to generalize that courts nearly always defer to agency expertise and uphold the broad exercise of agency discretion, unless a problem in one of the four areas above is found. (For a more detailed analysis of the legal issues presented by the TED controversy, see *Louisiana Coastal Law* No. 56, Aug. 1987, at 4-5.)

VII. THE NATURE OF SHRIMP FISHERMEN'S OBJECTIONS

Shrimp fishermen opposed to mandatory use of TEDs in trawl nets have put forth at least eight objections to their use. The four most commonly heard arguments are these: (1) "We don't catch turtles"; (2) "TEDs don't work"; (3) "TEDs cause too much shrimp loss for us to make money"; and (4) "We're being treated unfairly." These and other objections, in approximate descending order of the importance the fishermen attach to them, are discussed below.

A. Unacceptable Reduction in Shrimp Catch

Shrimpers have complained that TED escape openings clog with debris and funnel shrimp out of the nets, and that their use increases "down time," when shrimp trawls are out of the water. TEDs are also susceptible to clogging by

seagrass, and they may cause nets to drag bottom, making them vulnerable to damage from underwater obstructions. NMFS has responded that "if commercial shrimp trawlers properly install and use the NMFS TED there should be no significant loss of shrimp. . . . Due to the bycatch reduction features of TEDs, a number of shrimpers have indicated that they could tow longer because TED-equipped nets did not fill up as fast and did not require as frequent emptying as nets without TEDs." 52 *Fed. Reg.* 24,245-24,246 (June 29, 1987).

A side-by-side comparison test was conducted under the auspices of University of Georgia Sea Grant in the Cape Canaveral Channel off Florida during August, 1986. All models were found effective in excluding loggerhead turtles found in the area (although to the embarrassment of NMFS officials, their own version was found to have drowned one turtle during the test run.) The NMFS model reduced unwanted bycatch of jellyfish, sponges, and finfish by 44 percent, while diminishing shrimp catch by 7.7 percent. The Georgia Jumper reduced bycatch by 24 percent and *increased* shrimp catch by 25.5 percent. The Cameron TED reduced bycatch by 33.5 percent and reduced shrimp catch by one percent, while the Matagorda TED reduced bycatch by 44.5 percent and cut shrimp catch by 7 percent.

Shrimp fishermen are skeptical of this series of tests, particularly of results that show an increase in shrimp catch. Some have complained that the tests were conducted at an inappropriate time of the year, when the shrimp catch was too small for reliable measurement. Others object that the results are entirely inapplicable to the Gulf. In fact, these criticisms may be justified. The tests were conducted in the Atlantic only, and their purpose was to determine effectiveness in excluding turtles, not to provide data on shrimp retention.

The Georgia Sea Grant crew ran another series of tests in the fall of 1986 off the coast of Georgia. The results this time showed figures varying from a four percent gain to a 23 percent loss in shrimp catch. Shrimpers who have tried TEDs under the voluntary program have reported losses between 15 and 28 percent.

More sophisticated shrimp retention tests are now occurring under auspices of Sea Grant and several state agencies. It is apparent, however, both from anecdotal evidence and from formal testing already undertaken, that under normal circumstances towing a TED will result in a reduction of shrimp catch—at least initially. The degree of that loss will vary according to weather conditions, the type of TED used, the skill of the fishermen towing the net, the nature of the bottom, and perhaps differences in water temperature, salinity, and depth.

It is possible, however, that as fishing crews gain skill in handling a TED, shrimp catch can be increased to a point that approaches what has been usual without the device. Further refinements will no doubt solve other problems associated with TED use, such as net chafing. With elimination of material that clogs nets, perhaps eventually the cost in lost shrimp will be offset by increase in towing time. Early reports from TED users in Florida's Canaveral Channel have yielded few complaints. *National Fisherman*, Jan. 1988 at 71.

Ultimately, the economic impact of the TED regulation should be slight in comparison to the total costs of shrimping. But in the short term, installation of a TED will create economic hardship for some fishermen. On this point, fishermen's fears may be justified. When a vessel operates on a profit margin of 20 percent or less, even a temporary reduction in total catch can be fatal, driving some fishermen out of the fishery.

B. TEDs Are Hazardous to Deckhands

Installation of TEDs involves complication of gear, and it is arguable that complication increases hazard. TED use may increase hazard to crewmen, particularly in stormy seas when the device may swing wildly above the trawl deck.

Yet in more than 15,000 hours of testing on commercial shrimp trawlers and many more hours of actual use, only one TED-related injury has been documented (and that injury was found to have been caused by improper use of gear other than a TED). Because of open winches, exposed lines and heavy gear such as trawl doors and nets, trawl decks are dangerous places. Will proper use of a TED increase this hazard significantly? Probably not. Vessel captains can compensate for added hazard by extra care. And one might reasonably ask: if TEDs were truly a trawl efficiency device—i.e., if they really did increase shrimp catch—would this supposed hazard deter vessel owners from installing them?

The possibility of injury, however, takes on added significance if there is any truth to dockside gossip that some militant shrimpers, perhaps unaware of criminal penalties for fraud, are planning to stage a few injuries. Their intent, so it is told, is to drive private TED manufacturers out of business with lawsuit harassment. Even if this misguided strategy were successful, it would succeed only in forcing the government into the TED manufacturing business and in limiting fishermen's choices.

C. The Regulation Requiring TEDs Is Based on Inadequate Data

Fishermen have raised questions about the accuracy and completeness of scientific data used to project size of turtle populations and number of turtle deaths directly attributable to fishing. In fact, there are no reliable data on turtle captures in inshore waters. As a result NMFS modified the final rule by eliminating the TED requirement for inshore waters if tow-time restrictions are observed.

Fishermen also complain that scientists have not adequately considered the many co-variables that might be involved in turtle mortality. It is true that some of the evidence implicating shrimp vessels in turtle mortality is circumstantial. Earlier it was mentioned that ever since records have been kept, it has been noticed that peaks in turtle strandings have coincided with peaks in shrimp fishing effort. This is, of course, a circumstantial link, and fails to take account of obvious co-variables such as water temperatures or seasonal increases in Gulf activities other than fishing.

Industry estimates of turtle capture are of course far lower than NMFS estimates. The variance is striking when one compares the NMFS estimate of annual turtle capture in the Gulf and South Atlantic—47,973 turtles—with an industry estimate of 12,/06 turtles. NMFS, moreover, estimates annual turtle kill of 11,179 animals; an industry source estimates 572. *National Fisherman*, June 1987 at 15.

NMFS observers have documented a rate of one turtle capture for every 31 hours of towing off eastern Florida. Between 20 and 40 percent of the turtles are dead when brought aboard. Although a sea turtle capture may be a rare event for an individual fisherman, when total trawling time (several million hours every year) is considered, extrapolated total catch and mortality of sea turtles will be an unacceptably large number.

NMFS estimates are calculated with the use of sophisticated statistical techniques such as linear regression, incomprehensible to those untrained in

statistical analysis. But so long as neutral observers are not on board shrimp vessels to record actual number of captures, statistical techniques are necessary to make scientific estimates.

Fishermen, however, cannot be convinced of the large turtle mortality that scientists project. They suspect the accuracy of government figures and perhaps even the good faith of those who collect the data. This occurs because fishermen hear reports only from fellow fishermen whose annual capture may be lower than the statistical average. (Some shrimpers testified, no doubt truthfully, that in 10 or more years of fishing, they have never caught a sea turtle.) An obvious problem with basing scientific estimates on anecdotal evidence is that fishermen who capture or kill a large number of turtles will never be heard from.

The law does not require that management decisions be based on perfect data, but rather on the best available data. Anecdotal accounts from those with an obvious interest in the outcome cannot be the only basis for scientific management. The only reasonable prospect for improvement in the quality of scientific data on turtle capture and mortality would be to place government observers on all shrimping vessels, or at least on more of them. Unless the shrimp industry is willing to bear the cost and inconvenience of government observers, shrimpers have no choice but to accept scientific estimates. They cannot themselves generate data that measure up to what the law requires.

D. Inadequacy of Representation at Negotiations

Shrimpers, both commercial and recreational, have complained that they lacked adequate representation at the negotiations that led to the proposed rule. A number of state officials have raised the same objection. In fact, the shrimpers' organizations that attended the negotiation sessions represented only a small percentage of the shrimping population. Many shrimpers were at the time unaware of the negotiations or of an impending TED requirement.

No law, however, requires that all conceivable interests be represented at deliberations that lead to a proposed rule. What the federal Administrative Procedure Act requires is that interested parties receive notice on an impending rule (the notice requirement is ordinarily satisfied by publication in the *Federal Register*), and that they have an opportunity to comment.

All NMFS-sponsored meetings on the TED rule were open to the public, and portions of the negotiation sessions were open to any interested party. Public hearings (not required by the Administrative Procedure Act) were held in every state where affected shrimpers reside, and also in Washington, D.C. NMFS conferred also with representatives of Attorney Generals' offices and resource agencies in several states.

It is possible that a court of law might find that NMFS failed to satisfy some procedural requirement in promulgating the TED regulation. But available information suggests that not only were the notice and comment requirements of the Administrative Procedure Act satisfied, but that the agency volunteered far more effort to spread the word and to solicit comment than the law requires.

E. Other Factors Are Greater Cause of Turtle Deaths

There is no doubt that degradation of sea turtles' critical habitat and proliferation of beachside development have been important causes in the decline of sea turtle populations. Also to blame are other fisheries (the menhaden fishery in particular is known to cause turtle deaths), pollution discharges, plastic debris (which sea turtles sometimes eat, mistaking plastic bags for jellyfish), dredging

operations, and underwater explosives used in seismic testing and dismantling offshore oil rigs. On occasion, military operations also involve use of underwater explosives.

An even more important contributing cause of population decline may be a long-standing custom in parts of Florida and in certain Latin American nations of eating turtle eggs and making jewelry from their shells. Sea turtles are particularly vulnerable to capture when they return to beaches to nest, and in past years—especially in the 1940s and 1950s—it was common on certain beaches in Mexico and Honduras for crowds to gather at nesting time to capture turtles and eggs. Although most Mexican beaches where turtles nest are now protected, some poaching continues to occur.

Shrimpers and state officials have proposed expanded hatchery programs as an alternative to requiring that shrimpers pull TEDs. As a model they point to the "head-start" program for endangered sea turtles conducted by the NMFS laboratories at Galveston, with the cooperation of the U.S. Fish and Wildlife Service. Since 1979 the program has been raising Kemp's ridley juveniles, and releasing them after a year from a protected beach on North Padre Island. Under a cooperative research program, the Mexican government provides some 1,500 to 2,000 eggs for "head-starting" every year. The hope is that the juvenile turtles will become "imprinted" on that beach, and will return as adults to establish a nesting ground there rather than on their native Mexican beach. To date about 12,000 juveniles have been released, and this year's survival rate from hatching to release was an astonishing 98.6 percent.

As promising as head-start programs like this may be for endangered sea turtle populations, it is biologically risky to rely on hatcheries as the primary mitigation effort. It is not yet known whether released juveniles will return to the point of release or to their ancestral nesting beach in Mexico—or indeed, whether they will return at all. No juvenile Kemp's ridleys raised in captivity have even returned to their point of release, for they have not had time to mature since the program began in 1979. (Female Kemp's ridley turtles take about 10 years to mature, so new recruits may start returning in a year or two if the program is successful.) In addition, biologists urge caution in experimenting with depleted turtle populations, and recommend that no more than five percent of available eggs be removed from the wild population for experimental programs.

Shrimpers are correct when they point out that causes other than trawl nets contribute to turtle mortality, and that these must be addressed before turtle populations can recover fully. Perhaps they are even correct when they complain that other causes are responsible for more turtle deaths than shrimp trawls, and that it is unfair for the government and the environmental community to single out shrimpers to bear the burdens of turtle protection. Shouldn't environmentalists instead be directing their energies at discouraging international trade in turtle products and turtle consumption? This approach, as concerned shrimpers have pointed out, has been effective with whales and seals. *National Fisherman*, June 1987 at 15.

Many shrimpers would like to see other mitigation efforts exhausted before TEDs become mandatory. Some go so far as to propose a tax on shrimp vessels or on shrimp landings, perhaps to be matched with federal funds or contributions from the environmental community, in order to fund turtle hatcheries. A problem with this is that the TED requirement is relatively easy to implement, while

alternatives such as habitat restoration require fundamental changes in law and economic policies. TEDs are technologically simple, and a TED rule is far less costly to society than any of the alternatives—all of which must be accomplished at considerable public expense.

Shrimpers are correct when they observe that the problem of turtle mortality must not be blamed on them alone, and that greater effort should be made on all fronts—hatchery propagation, greater protection or critical habitat, and greater controls on mortalities associated with oil and gas development. But the urgency of the threat to the Kemp's ridley turtle demands a response that is immediately effective. Imposition of a TED requirement will not await progress on other fronts, because it is both the most cost-effective mitigation alternative yet proposed and the easiest to implement.

F. TEDs Are Futile if Other Gulf Nations Don't Require Them

There is validity in this argument also. Without coordinated management across international boundaries, conservation gains in one nation may be easily lost as the benefits accrue not to the health of turtle populations themselves, but rather to fisheries in nations where regulation is less strict. In such a situation, any nation through whose jurisdication a migratory sea turtle passes has the power to negate conservation gains made at great cost in any of the others. The greatest economic benefits accrue to fisheries in those nations which are least conscientious about conservation. Such are the economic realities of endangered species whose ranges transcend national boundaries.

In recognition of this fact, a bill to amend the ESA was introduced in Congress on March 17, 1987. H.R.1658, introduced by Solomon Ortiz (D-TX), would ban import of shrimp and shrimp products from nations that lack provisions comparable to those in the United States for protecting endangered or threatened species from incidental capture. At this writing the bill is still in committee.

If no other Gulf and Caribbean nations followed suit, it is quite likely that mandatory TEDs installed and operated at some sacrifice by U.S. shrimp fishermen would ultimately prove futile, at least for saving the Kemp's ridley turtle. There are, however, some grounds for optimism. The critical nesting site of the Kemp's ridley at Rancho Nuevo, Mexico has been a turtle sanctuary for 21 years. One NMFS official described it as "possibly the most guarded, protected beach in the world." In October 1986, the government of Mexico designated 15 more Gulf beaches as sea turtle sanctuaries. And in late March 1987, the Mexican Secretary for Fisheries announced in a communique with the U.S. Fish and Wildlife Service that Mexico will soon require TEDs in all shrimp trawls in Mexican waters of the Gulf, with no exceptions allowed. The Secretary also asked the U.S. government for help in conducting tests.

Fortunately there are indications that coordinated international management may be possible. Various international treaties to which the U.S. is a party have possible bearing on efforts to limit incidental catch of endangered sea turtles. They are: (1) the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (the 1983 Cartagena Convention); (2) the Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere (1940); (3) the Convention on International Trade in Threatened and Endangered Species (CITES, 1973); and (4) the Bonn Convention for the Conservation of Migratory Wild Animals (1987). While discussion of the

provisions of these treaties and their potential usefulness in protecting sea turtles lies beyond the scope of this article, they are listed here to show that whatever action the U.S. takes need not be unilateral.

G. TEDs Result in Increased Insurance Costs and Consumption of Fuel

It is said that some NMFS agents originally told fishermen that use of TEDs would provide fuel savings to fishing vessels. If so, no documentation was provided. In fact, any device that complicates net pattern is likely to increase drag, with resulting fuel loss. It is possible, however, that TEDs actually reduce drag by keeping nets from clogging with unwanted debris. Whether TEDs create a net increase or reduction in drag is not yet decisively known.

Although formal testing on differences in fuel consumption have apparently not been undertaken, fishermen who have tried TEDs have reported fuel consumption increase of about 10 percent. *National Fisherman*, June 1987 at 14. Even allowing for unreliability of data provided by parties with an interest in the outcome, this is not an unreasonable guess. TEDs may increase fishermen's fuel costs, as well as costs associated with purchase, maintenance, and decrease in shrimp catch. Whether this increase will be significant is not yet known.

Some fishermen have complained that their insurance premiums will increase because of accidents and injuries associated with TED use. Regarding insurance rates, NMFS conducted a survey of several companies active in supplying marine insurance. No company or its agents suggested that coverage or premiums would be changed only because TEDs were required by regulation.

H. Gear Not Adequately Tested In Some Locations

Some state officials have objected that TEDs were not tested in their state waters, and some shrimpers have complained that TED gear was not tested inside the ten-fathom contour in the northern Gulf States. NMFS officials respond that the opportunity to experiment with TEDs in inshore waters was offered, but no interest was expressed. In 1985, as part of the NMFS Technology Transfer Program, the Gulf and South Atlantic Fisheries Development Foundation offered $30,000 to each Gulf state to conduct TED tests in state waters. Only Texas accepted the proposal at the time, although at this writing all Gulf states are carrying out TED tests with the aid of foundation grants.

VIII. CONCLUSION: WHO PAYS FOR ENDANGERED SPECIES PROTECTION?

Using a start-up cost of $400-$600 for every TED installed, and figuring a life expectancy of two years for the gear, NMFS has estimated that the annual cost per vessel of towing a TED will range from $400 to $1,500. That figure, however, includes only costs associated with purchase, installation, and maintenance of a TED; it does not calculate nor amortize possible reduction of shrimp catch. Shrimp fishermen are understandably concerned with the question of how much it will cost to pull a TED. But it is also pertinent to ask, what is the likely cost of *not* using a TED?

Unlike up-front expenditures, those costs are hidden. Apart from the unquantifiable loss associated with mortality of endangered animals, it is possible that shrimpers who resist TED use may also face disastrous costs of defending their traditional fishing methods. These defense costs may come not only from civil and criminal penalties, but also from lawsuits instigated by determined

environmentalists, any one of whom has power to enforce the provisions of the ESA.

A court-ordered shutdown of the shrimp fishery is also a real possibility if shrimpers succeed in resisting or delaying the rule; in 1976 a federal court of appeals almost closed down the tuna purse-seine fishery for unacceptable incidental catch of dolphins. *Committee for Humane Legislation, Inc. v. Richardson*, 540 F.2d 1141 (D.C. Cir.). (The court ordered closure of the fishery, but stayed the order for a short time to allow NMFS to devise an acceptable regulation.)

Moreover, a consumer boycott, such as what happened to the tuna industry in the 1970s because of incidental catch of dolphins, is not an unrealistic prospect if environmentalists can enlist widespread public support. With paying members of the major environmental organizations numbering in the hundreds of thousands, perhaps even millions, they have the means to mobilize public sentiment if they unite to do so. Numbers of those active in the shrimp industry are slight in comparison, and even a small-scale consumer boycott could be disastrous to an industry where profit margins are slim and competition from imported shrimp is increasing.

While shrimp industry spokesmen may have the attention of their representatives in Congress and in statehouses, on a national scale environmentalists are likely to have far more influence. For this reason, the author believes it unlikely that Congress will amend the ESA to create an exemption for shrimp trawlers. In a comparable situation in the 1970s, Congress declined to amend the Marine Mammal Protection Act, 16 U.S.C. §§1361-1384, despite intense pressure from the economically influential tuna industry to permit increased incidental take of porpoises.

Fishermen, like all others, naturally seek to protect their interests, and are quick to resist a threatened reduction of income. In protesting the TED regulations they are exercising their political rights in a manner available to and expected from all American citizens. They are arguably within their rights even when they threaten civil disobedience of rules they feel they cannot live with. In the conflict between the survival of endangered turtles and the health of an entire fishing industry, and among governmental officials, shrimpers, and environmentalists, there are no villains.

There may, however, be losers. If the law requires that the turtles be protected, then the question ultimately becomes: who pays for that protection? The primary beneficiaries, the turtles themselves, cannot pay, so the burden must fall on either (1) the shrimp industry, (2) consumers of shrimp, (3) the American taxpayers, or on any combination of these three.

Should fishermen be compensated for any reduction in income that TEDs may cause, or should they be obliged to bear the burden themselves? Under American law, an owner of property rights must be compensated when those rights are taken for public benefit, or when those rights are so severely restricted that no reasonable use is left to the property owner. Many fishermen mistakenly believe that their pursuit of a living by capture of a common-property resource is a property right.

The law, however, is quite the contrary. No higher court of law in the United States has ever found a "right" for a non-Indian American to pursue a common-property resource for profit. (Fishing rights reserved for some American Indian

tribes are derived from treaties.) Fishermen and other pursuers of wild game have no property right in a fishery or an animal until captured by lawful means. Under U.S. law, fishermen have no "right" to fish; instead they have a "license" or a privilege to pursue a common-property resource, provided that pursuit and capture are done legally.

If society owes no compensation to fishermen for the TED burden, then it may be asked: is it fair that the burden fall on fishermen alone? Fairness, in this case as in many others, is constrained by the limits of what a government can do. No government has the resources to compensate business enterprises for the burdens of regulation. No one, for example, expects the government to compensate the automobile industry for the burden of meeting air quality standards. That is universally regarded as a cost of doing business, a public benefit for which the industry itself (and ultimately consumers) must pay. It is a settled principle of American law that beneficiaries of common-property resources such as clean air must absorb costs of reasonable regulation.

The shrimp fishery is a common-property resource, and turtle protection is a public benefit. The same reasoning applies as in the case above. To cause unnecessary mortality in an endangered species in pursuit of profit creates what economists call an "externality"—i.e., a hidden subsidy to the shrimp industry, the cost of which is passed along to the public. To propose that primary mitigation of the problem should be accomplished at public expense (e.g., through expanded hatchery programs) defies long-settled principles of U.S. law. Without an overriding national interest in providing a steady supply of a food product that many consumers regard as a luxury item, the cost of protection that the law requires must be "internalized"—i.e., borne by those who are the primary beneficiaries of the public resource. As burdensome as the TED requirement may be for shrimp fishermen, it must be regarded as a cost of doing business for which the law can provide no relief.

The TED rule is a consequence of policy choices that the elected representatives of the American people made when the ESA was passed in 1973. The ESA provides no applicable exceptions for economic hardship, and evidence is strong that most Americans support the goals of the Act. For fourteen years the law has been an effective tool in preserving continuity of species that might otherwise have become extinct. To create an exception now for a single industry, however economically important, will send a message that the law does not really mean what is says.

For the first time, technology has made it possible for U.S. shrimpers to coexist with endangered sea turtles that frequent U.S. waters. How tragic and unnecessary it would be if organized defiance of the law forced marginal shrimp catchers out of business, either through compliance enforcement or through consumer boycott of shrimp products.

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FURTHER READING

M. Bean, *The Evolution of National Wildlife Law*, Praeger Books (1983).

K. Bjorndal, ed., *Biology and Conservation of Sea Turtles: Proceedings of the World Conference on Turtle Conservation*, Smithsonian Institution Press (1981).

A. Carr, *So Excellent a Fishe*, Anchor Books (1973).

A. F. Carr, "Crisis for the Atlantic Ridley," *Marine Turtle Newsletter* (May 1977).

Center for Environmental Education, *Sea Turtles & Shrimp Trawlers* (1986).

D. A. Fuller, *A Preliminary Evaluation of Informal Conversation with Fishermen Concerning the Occurence of Sea Turtles in Coastal Louisiana*, LSU Center for Wetland Resources, Coastal Fisheries Institute (1984).

Gulf of Mexico Fishery Management Council, *Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters* (rev. ed. 1981).

S. Hopkins & J. Richardson, *A Recovery Plan for Marine Turtles*, U.S. Govt. Printing Office (1984).

M. Kaufman, *An NGO Prepared Draft Protocol Concerning Specially Protected Areas and Wildlife in the Wider Caribbean Region* (June 15, 1987).

K. L. Liepmann, "Confidentiality in Environmental Mediation: Should Third Parties Have Access to the Process?", 14 *Boston College Environmental Affairs Law Review* 93 (1986).

National Marine Fisheries Service, *Construction and Installation Instructions for the Trawling Efficiency Device* (NOAA Technical Memo NMFS-SEFC-71, June 1985).

National Marine Fisheries Service, *Draft Supplement to the Final Environmental Impact Statement on Listing the Green Sea Turtle, Loggerhead Sea Turtle, and Pacific Ridley Sea Turtle Under the Endangered Species Act of 1973* (together with *Regulatory Impact Review*) (1987).

National Marine Fisheries Service, *Environmental Assessment of a Program to Reduce the Incidental Take of Turtles by the Commercial Shrimp Fishery of the Southeastern U.S.* (1983).

National Marine Fisheries Service, *Final Environmental Impact Statement Listing and Protecting the Green Sea Turtle, Loggerhead Sea Turtle, Pacific Ridley Sea Turtle Under the Endangered Species Act of 1973* (1978).

National Marine Fisheries Service, *Fisheries of the United States, 1986* (April, 1987).

National Marine Fisheries Service, *Five-year Status Reviews of Sea Turtles Listed Under the Endangered Species Act of 1973* (1985).

National Technical Information Service, *The U.S. Shrimp Industry: An Economic Profile for Policy and Regulatory Analysts* (1983).

H. Perritt, Jr., "Negotiated Rulemaking Before Federal Agencies: Evaluation of Recommendations by the Administrative Conference of the United States," 74 *Georgetown Law Journal* 1625 (1986).

Protected Species Program, Southeast Fisheries Center, National Marine Fisheries Service, *Annual Report FY 85, Trawling Efficiency Device Project* (1985).

J. Rudloe, *Time of the Turtle*, Penguin Books (1981).

L. Susskind & G. McMahon, "The Theory and Practice of Negotiated Rulemaking," 3 *Yale Journal on Regulation* 133 (1985).

N. Thompson, T. Henwood & W. Stuntz, *A Summary of Information on Three Species of Marine Turtles in U.S. Waters* (1986).

J. P. Warren, Texas Bay Shrimp Fishing: A Description and Management Model (unpublished Ph.D. dissertation, Texas A&M University, 1980).

J. W. Watson, J. F. Mitchell & A. K. Shah, *Trawling Efficiency Device: A New Concept for Selective Shrimp Trawling Gear*, Southeastern Fisheries Center, Pascagoula (1985).

J. Wilkins, "TEDs and the Endangered Species Act of 1983," *Louisiana Coastal Law* No. 56 (Aug. 1987).