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## Policy, Power and Science

The Implementation of Turtle Excluder Device Regulations in the U.S. Gulf of Mexico Shrimp Fishery

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**ABSTRACT** For the past decade shrimpers, environmentalists, sport fishermen, and fisheries administrators have been involved in legislative, legal, and administrative battles over the use of devices to exclude sea turtles from shrimpers' trawl nets to prevent their drowning. In the summer of 1989, the regulations requiring such devices began to be enforced. To protest, shrimpers blockaded several ports along the Texas and Louisiana coast. I describe what appears to be the final implementation of the turtle excluder device (TED) regulations on the Gulf of Mexico. Because it is central to the rhetoric of many policy discussions, I analyze the role "science" and scientists have played in this process.

### The Blockade

On 23 July 1989, a week after shrimping season opened in Texas, angry shrimpers drew their boats into lines to block egress from and access to ship channels at Galveston, Port Arthur, Port Aransas, and Brownsville, Texas, and Cameron, Louisiana. At Aransas Pass, 150 or more shrimp boats overwhelmed the Coast Guard and caught their cutters in the blockade. The Coast Guard attempted to break the blockade by blasting shrimpers with water and cutting their anchor cables. They failed. About 200 other shrimping craft blockaded the Houston and Galveston ship channels. Some surrounded the ferry from Galveston and forced it to stop (*Dallas Morning News*, 23 July 1989).

Sport fishing boats were held inside their ports or not allowed back in. This disrupted weekend fishing competitions and interrupted charter boat operations, depriving them of weekend income and turning some against the shrimpers. While some large offshore oilrig service boats and tenders ran the blockade, other boats were delayed.

Shrimpers would lose between \$2,000 and \$5,000 income every day they kept their boats on the blockade instead of fishing. They could not sacrifice their income for a long time (*Corpus Christi Caller-Times*, 23, 30 July 1989).

Hoping the shrimpers would "take it as a victory of some sort and . . . relax a little," the Coast Guard broadcast the news that Gulf coast congressmen would meet with the secretary of Commerce to negotiate a resolution (*ibid.*, 23 July 1989). The blockade broke up about noon the next day when the Coast Guard promised negotiations would be held. Shrimpers vowed to resume the blockade if negotiations were unsuccessful.

What precipitated this drastic action was the announcement that the Coast

Guard had been instructed to enforce a regulation that requires shrimpers to install devices in their nets to allow turtles to escape from them.

Shrimpers were as surprised as anyone else at the success of the spur-of-the-moment blockade. One shrimper said, "This is the first time in thirty-something years that the Texas fishermen have been together on anything" (ibid., 24 July 1989). The Gulf states - Florida, Alabama, Mississippi, Louisiana, and Texas - open their shrimping seasons at different times. Shrimpers gather for each opening, hoping for quick and relatively easy catches for at least a few days before the shrimps become scarce and more difficult to catch. As the shrimp supply diminishes, boats must trawl longer to fill their nets and trawl more to fill their holds. Shrimpers from the other Gulf states had converged on Texas ports for the opening of the Texas shrimp season.

Vietnamese and native Gulf coast shrimpers from all Gulf states joined in the blockade. No organization such as Concerned Shrimpers of America had organized the action. It developed literally over night as shrimpers expressed their outrage to one another on their radios (Cooper 1989a).

After a decade of uncertainty, the shrimpers are being required to modify their nets so that sea turtles cannot drown in them. Doing so, they reduce their catches significantly. This is not just an economic problem for shrimpers, but has become a political issue among environmentalists and coastal politicians.

Science has become a political weapon because environmental groups have sufficient funds to retain their own biologists and lawyers to put science in their own service. "Science" has become symbolic of the purity, awareness, and *progressiveness of environmentalists and sport fishermen as against the pollution, ignorance, and backwardness of shrimpers*. With no scientists working for them, shrimpers are powerless to create a favorable ideological atmosphere for commercial fishing. Bureaucratic science, by its very nature and conditions, serves the ends of policy rather than objective truth and its use is to justify decisions rather than to inform them (Mills 1959). These patterns are consequences of several historical developments: the growth of shrimping with otter trawls, the expansion of shrimping areas to distant waters in the Gulf of Mexico, the increasing size and expense of boats and gear, the deteriorating economic conditions of shrimpers, the disbanding of shrimpers' unions, and the inability of fishermen to affect policy processes. Fishing policy is supposed to be based on the best available scientific evidence. Scientific research became bureaucratized and used to justify policy rather than as a basis for policy formulation. In the process "science" has become a political weapon.

## History

Shrimp trawls were first introduced around 1918 along with motorized boats, and in the 1950s small inshore boats began to be replaced by larger Gulf boats capable of longer offshore trips (White 1977). Internal waters provided a smaller percentage of the total catch as the offshore catch increased. This process of using larger boats to seek shrimp farther from shore has continued as shrimpers

have begun to trawl royal red shrimp, discovered in 1960, and other species at deeper depths and farther from shore, seventy miles or more. Trawling at such depths requires larger boats and heavier gear (Perkins 1987).

The current system of shrimping began about 1950 with the location of new more distant fishing grounds in the Gulf, the development of mechanical processing equipment and freezing technology, fisheries research programs, and larger shrimp boats with new trawling gear. Local catches as well as imports increased. Within a few years shrimpers were caught in a squeeze between being able to pay off increasing debts for new technology and low prices for shrimp.

United-States-funded development programs in several areas of the Third World have helped construct, improve, and expand shrimp aquaculture operations. The United States now imports about 80 per cent of its shrimp. As imports have increased, prices for *domestic shrimp* have declined. As prices have declined, shrimpers have tried everything they can think of to increase their catches. They have invested in ever-larger boats and rigs to fish ever further out in the Gulf. As the price declines, they need to catch more. Their catch is such a small part of the total shrimp supply on the world or U.S. market that it does not affect prices.

From about 1915 to 1955, Gulf Coast shrimpers were organized into local and regional unions which negotiated with packers to set prices each season. With their new technology and debts, shrimpers were willing to take whatever price they could get rather than risk a strike. As this process developed, there were fewer and fewer price setting negotiations until 1955, when a Mississippi shrimpers' union was found to be in violation of antitrust legislation and outlawed. In 1922, the Capper-Volstead Act exempted farm cooperatives from the provisions of antitrust legislation (Cochrane 1979:114; Durrenberger 1984), but such legislation was not developed to exempt fishermen. Various courts found that shrimpers and other fishermen are firms, which antitrust laws preclude from colluding to set prices for their products. In the eyes of the law, a fisherman and his boat are a firm in the same sense as General Motors or ITT. Today shrimpers are noted for their "independence" and fisheries bureaucrats, the general public, processors, and the fishermen themselves think it impossible that they could ever operate collectively on any issue.

In 1920, only two years after the first use of trawl nets in inshore waters, sport fishermen organized to try to ban trawling. They argued that the trawls caught and killed numerous other species besides shrimp, among them the species recreational fishermen wished to pursue. This pressure has continued to the present day, and sport fishermen have become increasingly forceful and well organized. The powerful Gulf Coast Conservation Association is a group of doctors, lawyers, local and regional elites, and other influential, wealthy, dominant, determined, energetic individuals. They retain their own biologists and Washington lawyers, have well-defined legislative programs, and are a political force on the Gulf.

Other groups of conservationists and environmentalists have united such issues as industrial pollution of air and water, resource conservation, nuclear and

other waste disposal, preservation of marine and other animals and plants, global warming, and many other matters that relate to quality of life, health, diet, recreation, and the welfare of the human and other species. While they have not organized like the Green movement in Europe, they exert considerable informal political influence through legislative measures and court cases. They have successfully located themselves rhetorically on the side of "purity" against the many and varied forces of "pollution." Greenpeace and the Sierra Club are two such groups which have different histories but increasing funds and power, which they have used to propose and support legal and legislative measures to institute Turtle Excluder Device (TEDs) regulations and enforce them. The Audubon Society, named after the famous American naturalist, is another group with environmental interests. In most counties, cities, and towns, it has local organizations whose major interests center on amateur ornithology and an annual census of birds in North America. It also has a national organization that charts local groups, publishes a journal, and participates in environmental politics. Other environmentalist groups include the National Wildlife Federation, the Center for Environmental Education, Defenders of Wildlife, and the Monitor International Fund for Animals. There are many other groups of sportsmen-conservationists such as Ducks Unlimited and the Isaac Walton League.

#### **Turtle Excluder Devices: Proponents and Opponents**

In 1978, marine turtles were included in the Endangered Species Act, and the National Marine Fisheries Service (NMFS) charged to protect them at sea.

The NMFS developed and tested a Turtle Excluder Device (TED), hoping it would attract shrimpers by eliminating much unwanted by-catch of jellyfish, finfish, and trash as well as turtles. The NMFS TED is a wire cage about three feet on a side, with a top hinged at the front. A chute of bars runs from the bottom front to the top back. The motion of the water through the trawl washes any sizable turtle or fish that enters the front up the chute and through the hinged top to freedom. The shrimp continue through the bars of the chute into the bag of the trawl behind it (Edwards 1987; Taylor et al. 1985).

In 1983 NMFS promoted a voluntary TED program. They argued that only widespread voluntary use could avoid disastrously expensive legal confrontations that would result as environmentalists were determined to support enforcement of the Endangered Species Act (Fee 1987). By January 1986, it was clear that the voluntary program had failed after five years of effort (Edwards 1987:37).

In August 1986, the National Oceanic and Atmospheric Administration (NOAA) informed representatives of the Gulf shrimp industry about proposed regulations to require TEDs. A private environmentalist group, the Center for Environmental Education, immediately told the Department of Commerce it would sue NOAA and NMFS to have all shrimp trawlers equipped with TEDs by January 1987. NMFS invited shrimpers to discuss the issue with conservation groups (Durrenberger 1988).

The agreement required the use of one of four TEDs, each of which had passed NMFS tests confirming that they allow most turtles to escape the trawl nets. Even though representatives of the shrimping industry were involved in the decision, shrimpers have since repudiated the agreement (Johnson 1987).

In 1985 the Endangered Species Act expired. For three years, the TED program had been supported with emergency appropriations while the Act was debated.

In July of 1988 Alabama Senator Heflin and the chairman of the Senate environmental protection subcommittee worked on a compromise agreement that nongovernmental scientists would conduct studies of endangered turtles and the effectiveness of TEDs to determine whether the turtles were actually endangered, whether TEDs are effective, and how TEDs affect shrimp catches. Enforcement of the TED law would be delayed until May 1989.

It appears that Heflin had in mind new studies, though he did not specify just who should conduct them. There was an ambiguity that led to two distinct opinions. Fisheries bureaucrats, who arranged the studies, understood them to be reviews of existing work to determine whether they were methodologically acceptable or biased. Shrimpers, on the other hand, envisioned new studies based on new data collected by scientists from the National Academy of Science.

In early April 1989, 3,500 shrimpers gathered at a mass meeting of Concerned Shrimpers of America in Thibodaux, Louisiana. Shrimpers and speakers alike expressed confidence that the new studies by objective (not NMFS) scientists would show that they did not catch turtles. The scientists would see that the bottom was mud, not sand, as the bottoms had been where the original tests were done. The scientists would be able to observe the 30 to 50 per cent decrease in catch the TEDs cause. Shrimpers here and elsewhere have indicated that they think the scientists will collect new data, make new studies, observe them in their work situation. They are convinced that scientists of the American Academy of Science will tell the truth and the truth will vindicate the shrimpers. Their faith in science and its power seems almost religious. No speaker at the mass meeting said anything different.

Tee John Mialjevich, president of Concerned Shrimpers of America, the Attorney General of Louisiana, United States representative from Louisiana Billy Tauzin, Governor Roemer of Louisiana, and others addressed the meeting. The governor said that state wildlife agents should ignore TED laws until studies showed conclusively that TEDs work. He said he would take the issue to Washington and "tell George Bush to read my lips." Congressman Tauzin said, "We are going to win this war eventually. A fishing family deserves to live every bit as much as a farming family" (*New Orleans Times-Picayune*, 9 April 1989).

In another context, a Texas shrimp boat fleet owner said, "We feel like when the study comes back from the National Academy of Science, it'll prove what we've said all along - that Texas shrimpers don't catch any turtles off our coast" (*Corpus Christi Caller-Times*, 25 July 1989).

Unbeknownst to shrimpers, the "studies" would only review studies NMFS had already completed. A committee would be appointed to review the methodology of the studies to detect any bias. By the end of summer 1989, the committee

had not yet convened. Several fisheries administrators expressed the conviction that there had been no bias, and the findings would be vindicated. The shrimpers and the bureaucrats had in mind two quite different processes.

In July 1989, a year after Heflin's 1988 compromise agreement, but before the scientific review had started, the NMFS (under threat of lawsuits from conservationists) began to enforce its previous TED regulations. This provoked the shrimpers' spontaneous demonstration.

### Resolution

A delegation of senators and representatives from the coastal states met with Secretary of Commerce Robert Mosbacher and urged him to suspend the regulations. Representative Billy Tauzin had discussed the matter earlier with him and suggested that the regulations might lead to violence. During the blockade, Tauzin and others requested Mosbacher's help. "I told him he could help if he wanted to. But he says his lawyers were telling him he was on shaky ground, that he'd be sued if he modified the regulations. I said, 'so get sued, let the courts decide'" (Cooper 1989a:3). Mosbacher met with two dozen congressmen from the region and representatives who had discussed matters with shrimpers in Galveston (*Corpus Christi Caller-Times*, 30 July 1989).

The Coast Guard said it would file no charges against shrimpers, and Mosbacher agreed to suspend the regulations again for forty-five days. After that time, until the National Academy of Sciences study was completed, shrimpers would be allowed to keep their nets in the water no longer than ninety minutes at a time instead of the usual three hours, so as not to drown turtles. This announcement made shrimpers as happy as it made environmentalists angry (*ibid.*, 25 July 1989).

Mosbacher is from Houston, Texas. After he suspended the regulations, a political scientist at Rice University in Houston, said, "It seems pretty political to me, Texas fishermen appealing to a Texan for help" (*ibid.*, 30 July 1989).

A NMFS representative said that shrimpers were getting the wrong idea, thinking they would not have to use TEDs. He said they would have to use the devices eventually because economics was no consideration in the salvation of endangered species (*ibid.*, 25 July 1989).

Within two days the national Audubon Society called for a shrimp boycott to protest the Gulf fishermen's refusal to use TEDs. It urged all Americans not to purchase or eat any shrimp products. No one thought a boycott would have any impact on shrimpers, because most shrimp in America are imported. An Audubon Society spokesman criticized the Secretary of Commerce for responding to the blockade and said it was outrageous, goonish hooliganism (*ibid.*, 27 July 1989). Local Audubon Society leaders on the Gulf Coast repudiated the National Society's call for a boycott (*ibid.*, 28 July 1989).

The National Wildlife Federation sued the Secretary of Commerce immediately, claiming that his proposal had no scientific basis and offered no protection to the turtles. They argued that he had responded only to threats of violence,

that shrimpers would observe no time limits on trawling because it would cost them, and that the Secretary's suspension of the regulations was illegal (*ibid.*, 3 August 1989).

A Federal judge ruled that the Commerce Department must implement rules to protect turtles, but did not specify what those rules would be. If the Department prepared no new regulations, shrimpers would have to use TEDs. The Department said it would use trawling time limits. Environmentalists were pleased that the judge recognized the danger to turtles, but displeased that he did not mandate a return to the TEDs regulations (*ibid.*, 4 August 1989). The Commerce Department submitted new rules allowing a 105-minute tow instead of TEDs. This would allow 90 minutes to tow the nets, and 15 minutes to drop and retrieve them (*ibid.*, 5 August 1989). There would be a 105-minute fishing period, a 30-minute break, then another fishing period, and so on through the day. Anyone fishing in the break times would violate the law (*ibid.*, 8 August 1989).

The National Wildlife Federation went to court again, charging that the fishing-period scheme does not protect turtles. The courts refused to overturn the Secretary of Commerce's rule until September, when the time needed to promulgate rules elapsed. The judge argued that the rule had to be made before he could rule on it, and until such period of time had passed, the rule was not official (*ibid.*, 31 August 1989).

Early in September, the Commerce Department announced that shrimpers must use TEDs. The Department found that the time limits were ineffective; the National Oceanographic and Atmospheric Administration that limited trawling times would not protect turtles; the Coast Guard that shrimpers did not comply with the time limits (*ibid.*, 6 September 1989). The maximum penalty for failure to use a TED is a \$20,000 fine (*ibid.*, 8 September 1989).

When President Bush visited New Orleans, 400 to 500 shrimpers demonstrated to request his intervention. They wanted the TED requirement suspended until the National Academy study was completed (*ibid.*, 10 September 1989).

The TED laws had been formulated and implemented. In September 1989, less than 10 per cent of the boat the Coast Guard boarded were violating them (Fee 1990). Jim Fullilove, editor of the monthly *National Fisherman*, tried to organize a meeting of fishermen and gear specialists at a boat and commercial fishing exposition in New Orleans to discuss how best to use TEDs. Shrimpers said they would listen if anyone could explain how to use them so they would work as NMFS had promised. Gear specialists said they did not want to risk it. Fullilove concludes:

The standoff is intolerable and destructive. Bad feelings, anger and frustration run deep on both sides. Communications have broken down. Worse, many of the gear specialists are worried that they may be physically harmed. Time will sort out the TEDs battle, but there will be scars. If the struggle has accomplished anything positive, it is the example it provides of how not to solve a problem (Fullilove 1990:6).

It remains to assess the consequences of the new regulations.

## Consequences

TED regulations will have economic consequences. In recent years, the Gulf shrimp fleet caught more shrimp to sell at higher prices. The number of boats increased, and each boat increased its effort. Boats also increased in size. The increase in shrimp catch owed to more and larger boats fishing more days.

From 1971 to 1977, the cost of fuel increased 208 per cent and fixed costs (insurance, overhead, depreciation, interest) 149 per cent. Proportional to catch, costs increased 115 per cent, and the consumer price index (a measure of inflation) 50 per cent. Net income depended on vessel size and material. Wooden vessels and medium-size boats did better than larger steel-hulled vessels (cf. Fishery 1981).

For some years increasing shrimp prices offset increased expenses, but in 1980 prices fell, causing a cost-price "squeeze." Fuel efficiency became an important concern in vessel design and construction. Medium-size craft, 51 to 65 feet long, made about twice as much gross revenue per dollar of fuel expenditure as vessels over 65 feet, and did better than small ones. Large wooden boats landed \$7.65 of shrimp per dollar spent on fuel, while steel vessels of equal size landed only \$5.88 (ibid.).

In the past, when the cost-price balance was favorable and shrimp prices were rising, investments in shrimp boats were more profitable than alternative uses for capital. When prices fell, shrimpers continued to operate as long as they could pay their operating costs. When they could not make enough to cover expenses, they tied up. At this point, an owner would try to sell out, but since shrimping was no more attractive to anyone else, there was no market for boats (ibid.). By the late 1970s, "It [was] clear that the management of the shrimp fishery to achieve economic optimums [sic] would necessitate a drastic reduction in the amount of effort applied in the fishery, and hence a reduction in the number of vessels allowed to fish" (ibid.:3-4).

Since then, the number of boats has not decreased, but increased with the influx of Vietnamese shrimpers. Success in periods of high prices prompts investments that have engendered losses during periods of price decline. The importation of shrimp has contributed to lower domestic prices for shrimp, and while low prices may hurt shrimpers, they benefit packers and processors, so imports are unlikely to be curtailed.

In 1980, the Secretary of Commerce stated that the shrimp industry was in a critical situation because of increased fuel costs, declining demand, and depressed prices. He offered an assistance program of low-cost loans and research (Fishery 1981).

U.S. shrimping inside Mexico's 200-mile limit was terminated in 1980. About 17 per cent of Texas's catch and 19 per cent of its revenues were from Mexican waters. Most of the Mexican catch was landed at Brownsville and Port Isabel. Forty-seven per cent of the landings at these two ports were from Mexican waters. For all Gulf states, about 10 per cent of effort was in and landings were from Mexican waters. Economists predicted correctly that the diversion of this effort

from Mexican to U.S. waters would result in income losses (ibid.).

In sum, imports result in lower prices, and are uncontrolled. Fuel and other costs have increased more than shrimp prices. Because of the closing of Mexican waters and the influx of Vietnamese, more effort was directed to a fishery that was already overfished. Such factors do not affect all shrimpers in the same way. The effects are different for those with steel rather than wooden boats, larger or smaller rather than middle-size boats, those who are in deeper debt for their boats, those who own one rather than several or many boats.

TEDs will not have the same effect on all shrimpers. TEDs will reduce everyone's catches. How much catches will be reduced is debated and may never be established with certainty. TEDs will increase everyone's fuel expenditures because they add to the resistance of the gear and require more power to pull. TEDs may be responsible for accidents and may have an impact on insurance rates, though this will be differently felt as many owneroperators have no insurance since the rates for them are already prohibitively high.

It is certain, however, that given increasing costs, decreasing or stable prices, imports, increasing effort, increasing numbers of boats, the entrance of new fishermen into the fishery, and the closure of the Mexican waters, TEDs will not benefit anyone in the shrimping industry - fishermen, processors, or dealers.

Assuming that TEDs will have some positive impact on turtles, Patricia Sharpe (1988:105) asks the same question many shrimpers have, "Who pays for saving an endangered species?" As one shrimper put it, "Not one of those damn environmentalists would give twenty per cent of his paycheck for a turtle" (*Corpus Christi Caller-Times*, 30 July 1989).

Sharpe (1988:105) says, however, that "in the midst of rhetoric about the ruination of the shrimp industry, it's easy to ignore that other businesses bear the cost of regulations that provide a public good, such as clean air or safe workplaces." This analogy is false. It compares shrimp boats to large corporations, and it ignores social costs of polluted air and water that appear in rates of cancer, respiratory ailments, and other environmentally caused health problems as well as lost work, health care, and shortened human lives. Unsafe working conditions have similar social costs.

One reason TED regulations make no sense to shrimpers is that it is quite impossible to conceive of similar, parallel, or analogous social costs even if one or several turtle species become extinct. Because imports are so large a portion of the market that no possibility exists to pass the cost on to the consumer, shrimpers will pay the price of protecting turtles with TEDs. No wonder it appears unfair to them (White 1989).

In my 1988 article on TEDs I cited several studies that show the importance of variation among fishing operations from large forms to small household operations. I suggested that one of the most pressing needs of fisheries social science research on the Gulf is to determine the range of variation and the social, political, and economic implications of it. The economic and political response to TEDs will be determined by such factors. While the TED regulation is unlikely to destroy the Gulf shrimping industry, it is likely to make a significant difference

to some in the industry, and to alter its composition.

If the dispute continues, it is likely to focus on the National Academy of Science report when it is released. Shrimpers will be disappointed as it will do none of the things they are counting on it to do. Sport fishermen will not have achieved a Gulf of Mexico free of trawling or commercial fishing, and so will be likely to return to the fray for another round.

### Science and TEDs

Each side appeals to science. The shrimpers are convinced that impartial scientific study of the issues would show that they are not the major threat to turtles and that TEDs do not work nearly as well as some claim. Environmentalists cite scientific studies by biologists. It is not immediately apparent how many of these studies have been done by biologists directly or indirectly connected to the environmental movement like those the Gulf Coast Conservation Association retain and pay.

The bureaucrats make repeated reference to "scientific studies" that show TEDs do not reduce the shrimp catch by more than 10 per cent. One fisheries bureaucrat confided to me that the tests were based on numerous short tows because the biologists wanted a large sample to make the study appear statistically legitimate. Having witnessed the data collection, he said the "scientists" were more concerned to make their study meet criteria of statistical soundness than anything else. Therefore they made many short pulls of about twenty minutes rather than a few long pulls of three hours to simulate the usual operating conditions of shrimp trawls.

I interviewed a number of shrimpers before the blockade. They were part of a random sample of Vietnamese and native shrimpers, not individuals I had heard about or identified on other grounds. During the interviews, I talked to some shrimpers who were angry about almost everything, including TEDs, bureaucrats, and imports. Others were self-possessed, unflappable, cool-headed and less worried about the effects of events on them. All, Vietnamese and native alike, indicated that TEDs were their major concern, but some had actively participated in testing TEDs.

Reports from shrimpers who cooperated with biologists making the studies agree with the fisheries bureaucrat. These shrimpers tried to be of assistance because they had faith in scientific methods and wanted to improve conditions of fishing for everyone. They were not suspicious of biologists, scientific methodologies, or government programs.

Some shrimpers I interviewed had conducted their own TED tests or participated in field tests with NMFS biologists. One who conducted independent tests under many conditions of weather, bottom, and depth showed me log books and reported that his volunteered data had been rejected. One who participated in NMFS field tests said that the results of observations made under working conditions had been systematically discarded and disregarded.

He related that a NMFS observer had accompanied him and under normal

working conditions he lost 20 to 25 per cent of his catch. "I never got the TED to work. I tried to get the results of the study they did with me. They didn't use my results. They did it to make the numbers look right."

He explained that a trawl is a funnel with a bag at the end, and that the TED lengthens the narrow end of the funnel, changing the flow of the water. The stream of the water through the trawl forces fish, trash, and shrimp to the inner surfaces of the bag. As things accumulate on the inner surface, they line the bag and impede the flow of water, which begins to flow through the narrow end of the funnel rather than through the bag. The bag then acts as a parachute. For the first twenty minutes or so, the TED makes no difference. After that, when the bag begins to act as a parachute, much of the catch is propelled through the opening of the TED. Thus short pulls are not representative of actual working conditions, and NMFS observers have not accurately reported results under working conditions.

The National Academy of Sciences committee will assess the scientific adequacy of NMFS studies on TEDs, which reportedly amount to several "piles of paper three feet high." If they use such criteria as acceptability of analytical methods, the studies may all be satisfactory. If they include such criteria as field methodology, they may not.

White (1989) presents data to show that Gulf coast shrimpers' perceptions of their catch rate and turtle mortality are realistic and reasonable. He concludes that shrimpers would be satisfied with regulations, even if they are not in their interest, if they "make sense" and are "fair."

In the present instance, this would require (a) convincing them that turtles are in fact endangered, (b) presenting them with evidence that their activities are a significant threat, and (c) demonstrating that all culpable parties (whether beachfront developers, or foreign countries) are being proportionally burdened with responsibility for setting things right (White 1989:77).

The experience of shrimpers with NMFS personnel and other fisheries bureaucrats is not conducive to trust. When I interviewed shrimpers, many would ask initially whether I was a biologist. A number expressed hostility toward biologists. Various levels of policy-making bureaucracies have provisions for "public input." At least, there is usually some provision for publication, and a waiting period for public comments. There are often hearings. Consensus among fishermen and even fisheries bureaucrats is that such periods have little impact on policy once it is formulated. Based on their experience, fishermen take the stance of "what is the point, no one will listen." Smith (1988) has pointed out occupational barriers and Meltzoff (1988) has discussed cultural impediments that prevent fishermen from participating meaningfully. In the specific instance of TEDs their opinions have not been taken into account. They therefore see the regulation as unfair.

That some fisheries bureaucrats and scholars agree with shrimper perceptions suggests that shrimpers are not simply being disagreeable because of their struc-

tural position or their stake in the matter, though that may well shape their rhetoric.

As it happened, it was less important to convince shrimpers of anything than to convince judges and administrators. If there were no repetitions of the threatened violence of July after the regulations were in place, it was probably because shrimpers had already taken maximum advantage of the early season pulse of good shrimping and were less concerned about losses as the season progressed and catches declined.

### Sport, Science, and Policy

Sport fishermen have been trying to outlaw trawling almost since it was introduced to the Gulf of Mexico. It remains to be determined how much pressure to preserve turtles through the use of TEDs has been brought to bear by sport fishermen. Sport fishing groups have started calling for additional devices on trawls to exclude finfish so they will not be killed as incidental by-catch (Cooper 1989b; Fullilove 1990). It is certain that such finfish are not endangered species by any measure. Sport fishermen argue that the fish should be preserved for their sport. Shrimpers widely suspect that the main motive for such regulations is less to protect turtles or fish than to prohibit trawling in the Gulf of Mexico. There has been considerable controversy and litigation about the promulgation of fisheries regulations in the Gulf of Mexico (Shelfer 1987; Oertel 1987). Oertel writes:

As someone who represents the commercial fishing industry in Florida and confesses to such a bias, it is my impression that commercial fishermen want no more than a reasonable piece of the pie, while the recreational sector wants the entire resource for its exclusive use (1987:59).

The shrimpers' blockade was on a weekend and interfered with fishing tournaments and charter-boat operators. The businesses that cater to sport fishermen lost most of a weekend's income (*Corpus Christi Caller-Times*, 23 July 1989) and sued some of the shrimpers for restitution of losses (*ibid.*, 10 August 1989). Sport fishermen and the enterprises that serve them were vocal in their opposition to interference with their pursuits and, when I was in Port Aransas during the blockade, had no good word to say for shrimpers.

While shrimpers may gain national-level support from a few local politicians such as those Representatives and Senators who come from areas with many shrimpers, especially coastal Louisiana, some parts of coastal Texas, and coastal Alabama, it is clear that at the national level political support for shrimpers is slight. Politicians can profit much more by supporting environmentalist causes, which have the aura of purity and virtue. Environmentalists castigated Alabama's Senator Heflin for his stance on TEDs (Durrenberger 1988). Most politicians can better afford to be against rather than for commercial fishermen of all kinds. Sport fishermen therefore have a much more powerful political hand than shrimpers at both state and national levels. As one fisheries bureaucrat put it in a conversation with me, the question is whether the Gulf of Mexico will

be a recreational lake for the rich or a place to make a living. This is probably the proper context for thinking about the political and ideological consequences of the TED issue.

In policy and courtroom discourse, science has ceased to have any objective value or use. It has become emblematic of the purity, awareness, and progressiveness of environmentalists versus pollution, ignorance, and backwardness of shrimpers. Environmental groups have sufficient funds to retain their own biologists and lawyers. They create science in their own service. Shrimpers have no scientists working for them to invent a favorable ideological atmosphere for commercial fishing. Because of the very nature and conditions of bureaucratic science, it serves policy ends (Mills 1959). The issues of methodology have become so complex that a committee of the Academy of Sciences has to be appointed to sort them out. I expect that they will not get far because they will probably not inquire into the actual conditions of field collection of data. They will not collect new data or consult with shrimpers or observe them to learn of their working conditions. Nor, I suspect, will they delve into the sociology of knowledge to analyze the underlying assumptions that guide the collection and classification of data, the definition of facts, the formulation of questions, and the ideological and political origins of such propositions.

Sport fishing even affects anthropological analyses. Pálsson points out that many anthropologists

operate with a 'natural' model of fishing which emphasizes material context and ecological relations. Such a model draws attention to the adaptive significance of social organization, depicting the producer as an autonomous individual engaged in the technical act of catching fish. An alternative theoretical approach is needed which appreciates the differences between fishing economies and the social relations in which production is embedded (1989:1).

He relates the individualistic view to the fascination of the European leisure classes with the individualistic pursuit of mobile prey, terrestrial and aquatic. Fishing was for them, as it is for contemporary American sport fishermen, a nonsubsistence activity with recreational value. Pálsson goes on to quote Isaac Walton's *Angler* to exemplify this quality, and its nobility. In the United States, the Isaac Walton League, an association of sportsmen, takes his name and values. While the contemporary United States has no hereditary aristocracy, there is a class of wealthy and dominant who derive similar power and prestige pleasure from the pursuit of terrestrial and aquatic animals.

In the same way that agricultural "science" serves the interests of and ratifies the basic tenets and assumptions of agricultural policy (Durrenberger 1984, 1986), the "science" of fisheries authorizes and confirms policy. C. Wright Mills (1959) analyzed the dynamics of science in the service of policy. Administrators define the questions. Having defined the questions, they have also defined the presuppositions that give the questions their importance and meaning, the paradigmatic assumptions of any "research" to answer them.

An example of scientific ratification of policy is the economic analysis of fish-

ing boats based on the assumption that they are firms as the courts have defined them in the cases that broke the unions. The economic analyses of the *Fisheries Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*, issued in 1981 by the Gulf of Mexico Fishery Management Council of Tampa, Florida, rests on such assumptions. As in agriculture (Durrenberger 1984, 1986), if one assumes the operating units are firms, one can develop such an analysis, but there is reason to doubt that fishing boats are firms in the classical economic sense. This ought to be a question, not an assumption. Policy-oriented research takes it as an established fact.

One fisheries bureaucrat, discussing "important topics for social science research" his agency might fund asked: "Why are shrimpers so conservative?" White (1989) shows that the stereotype of the conservative shrimper is seriously misleading. The bureaucrat had built the assumption of the conservative shrimper into his "objective research question" and only awaited its demonstration by some social scientist.

Paredes (1985) has described the workings of the Gulf Coast Fisheries Management Council Scientific and Statistical Committee (SSC), whose task it is to inform the Council if the proposals it considers are based on the best available scientific data, whether the interpretations and analysis are appropriate, and whether the conclusions are scientifically warranted. The Committee is concerned to maintain the scientific purity of the SSC and not contaminate it with political matters. Paredes conjectures that the possibility of court challenges to managerial measures is behind these procedural rituals. Indeed Leary (1985:185), in his comment to Paredes' paper, verifies this when he says:

The use of the multidisciplinary, blue-ribbon panel of scientists as a review board has provided a position of strength in defense of plans and management regulations. Although there have been legal challenges to plans and the quality of data used, none has yet prevailed in court with respect to Gulf fishery management plans. The system seems to work.

Leary's criterion for "working" is procedural purity defensible in court. This takes for granted the point which Acheson (1985:183) makes explicit in the same context, that "it is impossible to promulgate any rules without causing some people to benefit and others to lose." While every administrator knows this from experience, it is just this experience which social scientists such as McCay (1985) try to describe when they point out, as she does, that these matters of allocation and distribution effects – political matters – are often what anthropologists are most competent to talk about, and that the issue of "big guys against little guys" is beyond the committee's purview. It is not that anthropologists or social scientists are the only ones to have noticed this, but that it is part of our subject matter, part of the data we try to understand while it is not part of the subject matter of biologists.

There are other criteria for whether a policy "works." A biological criterion is the state of the stocks managed. An economic one is the level of prosperity of fishermen, processors, or whomsoever the policy is meant to benefit. A politi-

cal one is the degree of acceptance or unrest which greets the policy.

The TED issue is supposed to hinge on a study, now more than a year overdue. There is no agreement about the subject or scope of the study. I do not think this or any scientific study of any kind has had or can have any major impact on the process. The shrimpers do not have the power to make use of science. Science has been used to justify policy, not as the basis for its formulation.

Environmentalists are a significant pressure group. Their environmental legislation lists sea turtles. The NMFS of the Department of Commerce is therefore charged to protect the turtles. It is possible to control shrimpers, but not American foreign or trade policy affecting the foreign production of shrimp and their importation into the United States. It is impossible to control foreign shrimpers, and difficult or impossible to control industry and real-estate development (Stimpson 1990). Fisheries policy makers, charged to protect turtles, have little option but to try to control shrimpers, as court cases show. Hence TED regulations, which must be justified by scientific studies. Hence the production of confirmatory studies to insure procedural purity and protect the agency. They try to control those variables they can control, make policy to those ends, and justify it with "scientific" studies. In addition, environmentalists have used scientists and their evidence in their own rhetorical interests, not in any objective way.

I am not arguing that biologists have lied or manufactured data or concocted bogus studies. I suspect they have done conscientious work and do not favor anyone. Rather, the paradigmatic assumptions of their assignments have guided them to questions whose answers confirm policy, questions such as: "Do TEDs save turtles?" The answer may well be "yes," but this may not be the most relevant question unless it has been predetermined that TEDs are to be used. When the question, "At what cost?" is asked, and the desired "correct" answer is "insignificant," confirmatory methodologies may be favored over equally or more plausible alternatives that might confirm considerable experience which suggests a substantial loss to shrimpers. In any case, as environmentalists point out, cost is irrelevant to the saving of endangered species.

Because of imported shrimp, this loss may be quite insignificant to the "industry as a whole." Alternatively, one could conceive of the industry as centered on domestic shrimpers rather than processors and dealers to arrive at a quite different assessment. The initial assumption of what "the industry" is, determines the answer to the question and is an assumption, not a fact; a judgement, not a finding. Justificatory science is not a consequence of dishonest people but simply a mechanical result of the conditions of its production.

I do not think anthropologists or other social scientists are immune from the attractions and pressures of bureaucratic "science." When sociologists are handsomely paid to testify as "expert" witnesses for insurance companies in court cases to determine the potential income loss owing to shrimpers' injuries, they have an interest in estimating lower rather than higher earnings to insure their own future commissions.

College and university faculty members know that their administrators collect substantial "overhead" from whatever research funds they may obtain. They



have a stake in applying for and doing whatever is required of them to acquire awards whether it be to prove that shrimpers are conservative or that shrimpers are unaware of market conditions. Research results may condition their chances of continued agency funding, and administrative favor at their own institutions. Considerable institutional and individual effort is expended to divine what agencies "want," to learn and speak "the language of the agency administrators." The more insubstantial the finances of the university or college, the greater the pressure in this direction.

Those social scientists who work for agencies are subject to the same direct and indirect pressures as biologists and other scientists in similar positions. Applied anthropologists do not develop questions from the conclusions of their work but receive them from their superiors. The power to formulate the question is the power to determine the kind of answer it receives (Mills 1959). Applied anthropologists relinquish that power. As more and more American anthropologists have become dependent on government agency jobs or funds, there has been an increasing rhetoric of justification to combat the conclusion that "applied anthropology is bad anthropology." As the papers in this journal indicate, there are plenty of counterexamples and I enjoin independence rather than isolation.

No TED study has asked important and interesting scientific questions. Since the important questions remain unasked, their answers cannot affect policy. They include questions about the political power of conservationist groups, the cultural analysis of conservationist ideologies, and their impact on the assumptions of "scientific" work, along with questions of the nature of household production units and how they function in the shrimp fishery (Durrenberger 1984), and the response of household production units to various economic changes, including the dynamics of the translation of economic to political issues (Durrenberger 1987, 1988). One reason such central questions remain unasked is that fisheries agencies with research funds do not see such questions as having any bearing on "applied" research or policy, and do not consider such projects for funding, much less fund them. Thus, when an event such as the shrimpers' blockade happens, they are left puzzled, and fall back on stereotypes of conservative or violent fishermen.

When "science" becomes rhetoric in the service of policy, it no longer has the status of a way of knowing things. It becomes, rather, a political weapon in the hands of those powerful enough to afford it.

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## Balancing Competition and Cooperation

Verbal Etiquette Among Maine Lobstermen

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*ABSTRACT* Maine lobstermen are competitors in a fishery in which one person's catch is likely to reduce the catch of others. They are also often neighbors and friends intertwined in a complex web of social ties. Balancing the inherent competition of the industry with the need for cooperation often requires delicate interactions. This paper examines some of the verbal etiquette used by lobstermen in two Maine lobstering communities to maintain this balance. It focuses on two types of interactions. The first is the management of information during radio conversations. The second type of interaction involves explanations of differences in success. Both of these types of interactions reflect the particular balance between competition and cooperation characterizing different social situations.

"Well Barney, I'm headed in."

"That's right Fred, we won't be far behind."

- Radio Conversation between two "Southern Harbor" lobstermen.

### Introduction

Conversations like the one given above are common occurrences on the VHF radio frequency used by the lobstermen in a small harbor on the southern part of the Maine coast which I will refer to as "Southern Harbor" (see Palmer 1989, 1990). It is simply a conversation between two lobstermen as they prepare to return to the harbor after a day of lobster-fishing. The only complicating factor is that neither of the lobstermen is named Barney or Fred. There is nothing particularly unusual about the use of nicknames, but the use of "Fred" and "Barney" in the radio transmissions of Southern Harbor lobstermen is part of the verbal etiquette involved in a delicate balance between competition and cooperation.

Maine lobstering like many commercial fisheries, involves characteristics of a common property, or at least a "communal property," resource (see Wilson and Acheson 1980; Wilson 1975; Acheson 1987). Usually all of the lobstermen from a given harbor compete for the lobsters in a small territory, and most lobsters are caught shortly after reaching legal size (Wilson and Acheson 1980; Acheson and Reidman 1982; Acheson 1975). The lobstermen's view that one person's catch is at the expense of the other people lobstering in the same territory is therefore fairly accurate (Acheson 1975, 1987). Lobsters are also usually found in only certain areas, and remain in one location long enough for competitors to move traps into the area (see Wilson and Acheson 1980; Martin and Lipfert