

## The 'Moral Economy' of Resistance

Turtle Excluder Devices and Gulf of Mexico Shrimp Fishermen

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**ABSTRACT** This article examines how shrimp fishermen in two communities on the Gulf of Mexico have responded to federal regulations requiring the use of Turtle Excluder Devices (TEDs) on shrimp trawlers. Coming at a time of contraction in the fishery due to low producer prices and high operating costs, TED regulations have engendered intense opposition in many areas. Resistance to TEDs stems from shrimpers' perception that the regulations are an unjust threat to their livelihoods. Such beliefs are not unlike those underlying other spontaneous resistance movements, such as agrarian uprisings of the poor and dispossessed. Recommendations for alternatives are made that would provide incentives for conservation while lessening the economic hardship of shrimpers and their families.

Responding to the decline of sea turtle populations in the Gulf of Mexico and south Atlantic, the National Marine Fisheries Service (NMFS) began a research program in 1978 to reduce the mortality of turtles caught in shrimp trawls. All sea turtles that occur in U.S. waters are listed as endangered under the Endangered Species Act of 1973. The Act prohibits capture of sea turtles within the United States, U.S. territorial waters, and on the high seas, except as authorized by the Secretary of Commerce or the Secretary of the Interior.

The method that NMFS selected to protect sea turtles was the Turtle Excluder Device (TED), a gear modification to be installed in the trawls of shrimp boats. A variety of TED designs have been introduced, but all have some common features. The TED consists of an angled metal grid or mesh that allows shrimp to pass into the catch bag of the net. Should a turtle or other large object enter the trawl, however, the TED is designed to eject it through a flap. According to NMFS, a prototype TED design tested in 1981 was 97% effective in releasing turtles from shrimp trawls with no loss of shrimp (Federal Register 1987:24244). Initially promoted as 'Trawling Efficiency Devices,' TEDs were also supposed to reduce operating costs by eliminating debris and unwanted bycatch from shrimp harvests. Despite these claims and subsequent refinements of the device, many shrimp fishermen have come to vehemently resist the use of TEDs.

This article evaluates fishermen's responses to TED regulations in the shrimping communities of Bayou La Batre, Alabama, and Biloxi, Mississippi.<sup>1</sup> From data collected in these communities in 1989 and 1990, it is apparent that many shrimpers' assessments of TEDs contrast sharply with the claims of the federal agencies mandating their use. Shrimpers' opposition to the device reflected their view that TED regulations

unjustly impair their livelihoods. As in other settings, such perceptions of inequity become a powerful political catalyst when 'moral rights' to subsistence are compromised by involuntary economic change (Scott 1976, 1985). This article documents the status of shrimpers' livelihoods in recent years and the effects of TEDs on shrimp catch as perceived by the fishermen who use them. In so doing, this article will demonstrate that shrimpers' attitudes do not result from an aversion to innovation, as is occasionally claimed by regulatory agencies. Rather, they emerge from perceived threats to fishermen's livelihoods and the coastal traditions they represent.

### The TED Controversy

The controversy and legal background concerning TED use have been thoroughly examined elsewhere (cf. Durrenberger 1989, 1990; White 1990). In the popular media the TED issue is usually depicted as a choice between two exclusive options. These alternatives pit the societal goal of sea turtle conservation against the economic disruption that the shrimp industry predicts from turtle conservation plans. The prevalent view among many government regulators and sectors of the environmental movement is that resistance to TEDs by shrimp fishermen is unjustified. This perspective is based upon a number of assumptions challenged by Gulf of Mexico shrimpers. The most critical of these is that shrimp trawling constitutes the greatest source of marine turtle mortality, with estimates of sea turtle drownings in shrimp nets ranging up to 55,000 per year in U.S. waters (NAS 1990:3).<sup>2</sup> Policymakers say that they selected the TED as an optimal solution to the threatened extinction of several turtle species, one that would conserve endangered turtles with minimal economic losses for fishermen.

These claims foundered on the skepticism, then outright hostility, of many shrimp fishermen to TEDs. Fishermen resisted the devices despite NMFS' claims to have reduced their weight and eliminated the catch losses of early designs. At a NMFS select committee hearing attended by one of the authors in 1991, federal officials even presented data indicating a 3.8% increase in shrimp catch (ostensibly from bycatch elimination) on vessels employed in experimental TED trials in the Gulf of Mexico. Some policymakers attribute fishermen's rejection of these inducements to their resistance to change, or less politely, ignorance. Elsewhere, White (1989) has demonstrated that modern shrimp fishing practices are the result of generations of gear innovation and experimentation. Nonetheless, many regulators and environmentalists continue to argue that shrimp fishermen resist any technology that differs from past practices.<sup>3</sup>

When shrimpers complain that TED use in practice does not replicate the low catch losses realized in government-sponsored TED trials, regulators commonly attribute such problems to fishermen's unfamiliarity with the devices. At the NMFS hearing mentioned above, the director of South Carolina's Fish and Wildlife Department answered shrimpers' concerns with the statement, 'If these guys can't get a TED to work, maybe the problem isn't a bad TED; maybe its that they're bad shrimpers.' More provocatively, resistance to TEDs is sometimes explained with the assertion that shrimpers are hostile to environmental concerns and have little desire to comply with conservation plans for any endangered species. To a large extent, this research was

undertaken to evaluate the claims and counter-claims about fishermen and their experiences with the new technology.

Given the highly charged attitudes concerning TED use among fishermen, the authors decided to meet with a local organization of shrimpers prior to undertaking research. The major research goals discussed with the fishermen were to evaluate the effects of TEDs on shrimpers' livelihoods, determine the present socioeconomic status of fishermen, and compare this status with data collected among the same informants three and five years prior to the present study.

The initial reaction to our request for cooperation in the research was one of considerable caution. The shrimpers felt that they had been misrepresented to the public by environmental organizations and government agencies. In one instance, a representative of an environmental group visited Bayou La Batre to gather information about shrimp fishing. After spending several days with a shrimping family, the visitor returned to his Washington office to declare that shrimpers were responsible for considerable turtle mortality. According to his former hosts in Bayou La Batre, this conclusion was derived from a single fishing trip in the Gulf that did not involve the capture of any turtles. While the incident would probably not affect the legal status of TED regulations, shrimpers were angered by their depiction as ignorant foes of conservation. The skepticism that greeted our research reflected this confrontational relationship with outsiders. We did not negotiate the goals of the research with shrimpers, but such meetings established some rapport with fishermen, who suggested questions that were relevant to their concerns. In examining these issues, we were schooled in the causes of their resistance to TEDs.

**Socioeconomic Conditions in Shrimping Communities**

Bayou La Batre, Alabama, and Biloxi, Mississippi, are two of the largest shrimping ports along the northern coast of the Gulf of Mexico. Each port is frequented by several hundred shrimp vessels that generate employment for local seafood processors and fleet maintenance industries. Yet Bayou La Batre and Biloxi also differ in the degree of their relative economic dependence on shrimping. Biloxi is a coastal city of over 40,000 permanent residents and at least as many seasonal visitors. In Biloxi, commercial fishing is distinctly secondary to tourism and revenues from a local air force base. In contrast, Bayou La Batre is a town of 8,000 residents, most of whom are directly or indirectly dependent upon the shrimp industry. Despite its small size, Bayou La Batre's heavy reliance on shrimp fishing makes it the seventh ranked U.S. port in the value of seafood landings (Graham, Brown and Rees 1988:5).

Table 1 provides demographic data on the sample of shrimp boat captains surveyed in Bayou La Batre and Biloxi. Substantial investments in both livelihood and capital provide shrimp captains little opportunity for occupational change. The average age of surveyed shrimp captains is approximately 46 years. With an average of nearly 23 years of shrimping experience each, most captains started fishing commercially in their teens or early twenties. The fact that shrimpers remain in their region of birth also indicates their commitment to a maritime occupation. A large majority (75%) of the fishermen surveyed in Bayou La Batre were born in the community or surrounding region and

most (80.4%) were raised in families involved in fishing for at least one previous generation. Typically, captains in both ports had completed less than a high school education. The knowledge that fishermen exhibit of the marine environment is considerable, but their age, limited formal education, specialized skills, and capital commitments to shrimping make it extremely difficult for them to change professions. This fact also makes it likely that they would vehemently resist perceived threats to livelihood.

Table 1. Demographic Profile of Shrimp Captains in Bayou La Batre and Biloxi (n=108)

	Mean	Median	Range
Age	45.7 yrs.	44.5 yrs.	24-84 yrs.
Household size	3.4	3	1-7
Formal education	10.8 yrs.	12 yrs.	0-16 yrs.
Amount of fishing experience	22.6 yrs.	20 yrs.	1-66 yrs.

Large numbers of bankruptcies in recent years attest to a worsening economic crisis in the Gulf of Mexico shrimp fishery. Incomes from shrimping have always been cyclical, reflecting year-to-year variations in catch, but long-term trends in fleet activity and incomes since the early 1980s suggest an irreversible contraction in the industry. Although no precise data exist on active fleet size, declining license applications indicate deepening attrition in the fishery. In 1991, 503 Alabama commercial licenses were applied for by owners of offshore shrimp boats, less than one half the 1987 level of 1,076 (see table 2). By 1992, 37.5% (27 out of 72) of the Bayou La Batre shrimpers previously surveyed in 1985 had left the fishing industry, most due to foreclosure. According to one key informant, the owner of a local vessel repair shop, only 38 offshore boats continued to operate from Bayou La Batre in early 1992. For Bayou La Batre offshore shrimpers, mean annual income fell steadily from \$23,750 in 1984 to \$22,187 in 1989. Controlling for inflation, 1989 incomes from shrimping represent 22% lower real earnings than five years earlier.

Table 2. Distribution of Shrimp Fishing Craft Licenses Issued by Alabama for 1988-1991

Year	< 30 ft.	> 30 ft.	total
1988	2,141	1,076	3,217
1989	1,784	613	2,397
1990	1,264	517	1,781
1991	985	503	1,488

Source: Alabama Department of Conservation and Natural Resources

The economic profile of Biloxi and Bayou La Batre shrimpers (table 3) indicates sources of income and expenditures in fishing activities. While 72% of Bayou La Batre fishermen are engaged solely in shrimp fishing, the remainder seasonally supplemented their incomes with other types of fishing, as well as employment in land-based sectors

such as ship-building and construction. In Bayou La Batre, approximately 69% of the sample's average household income came from shrimping, with off-season work and wives' contributions comprising the remainder. There is considerably more specialization in shrimping in Bayou La Batre than in Biloxi, where fin-fishing, oystering, and crab fishing are alternate seasonal activities for shrimp fishermen.

Table 3. *Economic Profile of Shrimp Captains in Bayou La Batre and Biloxi (n=108)*

	Mean	Median	Range
Shrimping income	\$19,717	\$19,500	\$0-65,000
Est. boat value	\$211,063	\$242,500	\$16,000-750,000
Est. sale value	\$125,953	\$148,500	\$0-400,000
Operating costs			
per trip	\$3,315	\$4,000	\$45-7,500
per year	\$60,217	\$75,000	\$3,200-144,000
Best years income*	\$39,559	\$38,000	\$2,000-100,000
Worst years income**	\$11,819	\$13,000	\$0-70,000

\* Best year's mode

\*\* Worst year's mode

### Crisis in the Gulf Shrimp Fishery

Previous research (Durrenberger 1988, 1990; White 1989) has documented shrimpers' attitudes toward TEDs, but does not address the current status of the Gulf shrimp fishery, which in large part is responsible for the intensity of their resistance. The current economic crisis facing many shrimpers can be attributed to two trends originating in the past two decades. Escalating fuel prices since the early 1970s greatly increased production costs, particularly for the large offshore boats that had come to dominate the local fleet since the 1950s. A loan program of the Department of Commerce facilitated the purchase and upgrading of shrimp boats in the 1970s, much as agricultural policies encouraged land and equipment acquisition among farmers. Government loan programs permitted fleet expansion despite increasing fuel and other operating costs. Initially, climbing operating costs could be offset by increased retail prices for shrimp. By the mid 1980s, however, the price of Gulf of Mexico shrimp was no longer determined by the operating costs of the U.S. shrimp fleet, but by imports into the American market. From 31% of the fresh shrimp sold in the U.S. in 1980, imported shrimp made up 72% of U.S. sales by 1989 (Roberts 1990:9).

Most imported shrimp is produced under aquaculture in mainland China, Indonesia, Taiwan, and Ecuador (ibid.) Aquaculture shrimp is heavily subsidized by national governments, which have been encouraged by international lending agencies to promote shrimp as an export commodity. State agencies generally provide energy, inputs, and technical assistance to aquaculture operations at below market cost and shrimp farms take advantage of labor costs as low as .25 per hour (Bailey 1988:39). In addition to its extremely competitive prices, aquaculture shrimp are produced in large

standardized sizes that are convenient for American processors and restaurant suppliers. Standardization greatly reduces the amount of manual sorting required for repackaging and processing, permitting work force reductions and payroll savings. Several shrimp processors in Bayou La Batre that originally serviced the local fleet now deal exclusively with imported shrimp.

Largely due to shrimp importation, prices for shrimp caught by U.S. trawlers have fallen to lower absolute levels than a decade ago. In 1989 Gulf of Mexico shrimpers received on average \$1.29 per pound of shrimp, compared to \$1.37 per pound in 1980 (Anonymous 1990b:9). During the same period, operating costs continued to climb due to fuel and insurance price increases. Between 1985 and 1989, reported fuel and supply costs for Bayou La Batre offshore shrimp trawlers increased from an average of \$82,800 per year to \$92,905.

Because shrimping constitutes the largest share of the household income of Bayou La Batre fishermen, diminished earnings have reduced standards of living and forced fishermen to make severe economic adjustments. At present, slightly over 49% of the wives of shrimpers work outside the home to supplement their husbands' earnings. Wives' earnings now account for 31% of the total income of shrimping households. The worsening economic status of fishing households is indicated by the fact that most (67.6%) working wives entered the labor market within the last five years, and 32% began working outside the home in the last year alone. While a pattern of two wage earning heads of household is common among middle class Americans, it is not easily reconcilable with the demands of many fishing households (cf. Stiles 1972; Acheson 1989).

Traditionally, shrimpers' wives provided essential support roles for captains and crews. Wives usually managed the financial aspects of the shrimping operation and arranged for repairs when the fishing crew was at sea or in nonlocal ports. In order to keep their husbands' fishing boats in operation, women often traveled hundreds of miles on short notice to deliver spare parts and supplies to ports along the Gulf of Mexico. With their entry into the labor market, wives' ability to provide these support roles has been diminished. Changes in the household economy also exact psychological costs. As one Bayou La Batre informant noted of her shrimper husband:

He's worried about things at home that he shouldn't have to worry about. He should [only] have to worry about his time in the Gulf...He needs to know that his wife is taking care of everything else, and that when he goes in port for a repair, no matter where he goes, if it's Galveston or Key West, that she's gonna be there when he gets in, that she'll catch his line when he throws it to the dock. And if she can't do that it's gonna affect his work, and he's not gonna produce (Thomas 1990:52).

Cost-cutting measures may permit the survival of a fishing operation in the short-term, but they also contribute to long-term risk and loss of viability. Sixty percent of the fishermen surveyed in Bayou La Batre have changed crew composition or pay rates since 1987 to reduce expenses. Some 23.1% laid off crewmembers, reduced pay to half shares, or rely on unpaid family members. Crew reduction and use of inexperienced labor imply more intensive work effort and greater risk of injury. Approximately 35% of the offshore vessels operating from Bayou La Batre now do so with no insurance coverage, compared to less than 5% in 1985. Eliminating insurance coverage reduces operating costs by an average of \$13,000 per year, but it can also result in the loss of a boat due to personal liability in the event of a crewmember's accident. Similarly,

while second home mortgages may raise needed cash for boat repairs, in several instances in Bayou La Batre they have resulted in homelessness when a family's fishing operation was forced out of business.

In Bayou La Batre, 81.2% of all shrimpers report that they have made major austerity adjustments to the current economic crisis of the fishery. These responses range from deferring major purchases and educational expenses for children to taking out second home mortgages. Despite such sacrifices, many shrimpers continue to face the prospect of bankruptcy. This fact contributes to a measurable sense of despair among many fishermen.<sup>4</sup> Among the 68 shrimpers interviewed in Bayou La Batre in 1990, two suicides were reported in the following year. In both cases, captains shot themselves after their boats were foreclosed.

Given such discouraging trends, the economically rational course of action would be to abandon the fishery altogether. Yet few shrimpers can do so without crushing losses or the prospect of prolonged unemployment. Substantial investments in shrimp boats severely limit the occupational mobility of boat owners. The declining economic status of the fishery, combined with the prospect of stricter federal regulation, have greatly reduced the market value of shrimp boats. The few shrimp boat transactions in Bayou La Batre take place almost exclusively with buyers from Central America or west Africa, who hope to take advantage of low vessel prices in the U.S. In Bayou La Batre, the average reported capital investment in shrimp boats is \$261,000, while their average market value is only \$163,000. Hence, sale without bankruptcy is a remote prospect for most fishermen wishing to leave the industry. Similar data exist for the Biloxi fleet, where the average capital investment in a shrimp boat (\$125,000) is more than double its present market value.

Shrimpers state that they can only respond to their imperiled economic status with intensified work effort and austerity at home. While informants' average number of fishing trips per year declined slightly in the late 1980s (from 24.9 in 1985 to 21.7 in 1989), their total time at sea increased from approximately 180 to 189 days. Fishermen state that they are taking longer trips to compensate for high operating costs and low producer prices. White (1989) reveals how the stress of work routines in the fishery has increased in recent years. Merely to remain in business under current conditions, fishermen report working an average of nearly 100 hours per week during fishing trips (ibid.:75). This represents a substantial increase over work effort just a decade ago (ibid.).

The decline of the fishery was evident by the late 1980s, when TED regulations were introduced. From the perspective of fishermen, the device poses a decisive threat to their livelihood because of its reduction in shrimp yields (cf. Mialjevich 1987). Fishermen contend that TEDs easily become clogged with debris and bycatch, causing shrimp to be deflected out of the turtle exit flap in the net. Bayou La Batre fishermen estimate their catch losses when using TEDs at 33.8% on average, although their perceptions of catch reduction vary widely (table 4). Nearly 42% of those interviewed (45 out of 108) reported shrimp losses of between 25% and 35%. Given the narrow profit margins of most fishermen in recent years, such severe losses may prove fatal to many shrimping operations. Direct shrimp losses do not fully indicate the lost cash value of fishing trips made while using TEDs. Fishermen report major losses from weakened and torn nets, hang-ups on underwater obstructions, and increased downtime due to the need to check and clean nets of debris more frequently.

Table 4. Percent Catch Loss Estimated by Bayou La Batre and Biloxi Shrimpers (n=108)

Percent Loss	Frequency	Percent of Shrimpers
10 - < 15	4	3.7
15 - < 20	4	3.7
20 - < 25	9	8.4
25 - < 30	16	14.8
30 - < 35	29	26.8
35 - < 40	6	5.6
40 - < 45	12	11.1
45 - < 50	4	3.7
55 - < 60	17	15.7
60 - < 65	4	3.7
65 - < 70	2	1.8
70 - < 75	1	.9

Note: These reports were not all gathered on the basis of systematic trawl trials. Only 78% of those shrimpers interviewed based their responses on personal experience with TED use, while the remainder relied either on the experiences of estimates of others. None of the 108 shrimpers interviewed reported catch losses as low as those recorded in NMFS TED trials.

Shrimpers' experiences stand in sharp contrast to TEDs data collected in NFMS testing programs. Federal regulators assert that actual shrimp losses when TEDs are used properly do not exceed 4% of total catch. Most shrimpers reject such claims, asserting that official TED trials were conducted under ideal circumstances of short trawls and clean ocean bottoms. At least one federal official has privately acknowledged the former criticism, indicating that trawling times were shortened under testing procedures to provide a statistically significant number of trials (Durrenburger 1990:78). Many regulatory officials assert that shrimpers' problems with TED use do not represent an intrinsic design flaw. Rather, they contend that catch losses result from inexperience and a failure to 'fine tune' the device in ways that would improve its performance. While shrimpers' and NMFS' records of catch loss are widely at variance, trawl tests sponsored by the Mexican government tend to more closely support the former: under 'ideal condition' tests using side-by-side TED-equipped and unmodified nets, Mexican trawlers recorded a 17% loss in shrimp catch (Vidal 1988).

### Opposition to TED Regulations

Shrimpers' decidedly negative response to Turtle Excluder Devices was unanticipated by many federal officials. Beginning in 1980, the National Oceanic and Atmospheric Administration (NOAA) organized meetings between representatives of government, environmental groups, and the shrimp industry to solve the problem of turtle capture in shrimp nets. During these meetings, industry representatives agreed to implement a voluntary TED use program. By 1985, it was apparent that few shrimpers remained in the voluntary plan. After environmental groups sued the federal government to require shrimpers to use TEDs, the government announced a gradual phase-in of mandatory TED regulations in 1987. Until 1989, enforcement agents would only issue warnings to shrimpers who did not use TEDs in required areas.

Industry members who negotiated these measures were unable to secure the agreement of the shrimpers they ostensibly represented. Some shrimpers openly declared that they would surrender their boats and go to prison before submitting to TED regulations. Public hearings mandated under the proposed regulations were held in Washington D.C. and in sixteen sites throughout the Southeast. Government officials noted that they had never seen more people turn out to comment on any previous fisheries regulation (Conner 1987:14). At a public hearing in Thibodaux, Louisiana, 5,600 people filled the civic auditorium to capacity, forcing deployment of state police to maintain order. At meetings in Mississippi and Alabama, fishermen were turned away at the door for lack of space. From such meetings, and dissatisfaction with their appointed representatives, fishermen formed the Concerned Shrimpers of America in 1987 as a movement to overturn TED regulations.

Following the public hearing process and formation of CSA, shrimpers' organized opposition became so intense that the federal government repeatedly postponed its planned imposition of the regulations. Mail to congressional representatives from the southeastern states reportedly ran against the mandatory use of TEDs by a factor of ten-to-one (Connor 1987:14). Congressional delegations from these states introduced legislation that would delay TED regulations until the shrimp loss problem associated with the devices was reduced. Under pressure from constituents, state authorities in Louisiana instructed local fish and game officials not to cooperate with the federal government in TED enforcement. Federal authorities charged with TED enforcement also vacillated in the face of such pressure. Following the imposition of mandatory TED regulations in May, 1989, the U.S. Secretary of Commerce instructed enforcement agents to only issue warnings for TED violations until July.

During that summer shrimpers complained that seagrasses were clogging all approved TED designs in the Gulf, resulting in high shrimp losses. Despite shrimpers' warnings that frustration with the devices had reached a volatile level, the Secretary of Commerce ordered the Coast Guard to proceed with TED enforcement on July 22, 1989. This announcement provoked mass civil disobedience the following day, as shrimpers along the Gulf coast formed blockades at ship channels in Texas and Louisiana. At Aransas Pass, Texas, over 150 shrimp boats trapped Coast Guard cutters in a blockade, prompting them to request assistance from the National Guard. Despite the use of water cannon against shrimpers and attempts to cut their anchor chains, Coast Guard ships remained trapped for several hours. Similar confrontations were repeated in the ship channels at Galveston, Port Arthur, and Brownsville, Texas, and Cameron, Louisiana (Durrenberger 1990).

On July 24, the Secretary called for a regulatory change that would permit limited 90 minute tow times in lieu of pulling TEDs. Tow time limitations were based on the claim that turtle mortality in shrimp nets was negligible during short trawling periods. Shrimpers considered tow limits preferable to TEDs, but argued that time restrictions disrupted already stressed work and sleep routines. Environmentalists contended that tow limitations could not be enforced. The Secretary's decision was intended to prevent further outbreaks of civil disobedience, but it caused the National Wildlife Foundation and other environmental groups to file suit against him for failing to enforce the Endangered Species Act. With the Secretary's direction, TED enforcement by the Coast Guard finally went into effect on October 15, 1989.

In the end, organized resistance among shrimpers failed to stem the tide of TED regulations. Yet the fact that federal authorities were repeatedly forced to postpone enforcement indicates that collective resistance had some political effect. The coalescing of shrimp fishermen in a resistance movement was unprecedented in the Gulf of Mexico in recent times. Shrimpers themselves were surprised at the growth of their movement, for they often describe themselves as fiercely independent.<sup>5</sup> Such perceptions notwithstanding, few fishermen could be considered individualistic by the nature of their work. Most shrimpers have informal fishing partnerships with other captains that in some cases are sustained over decades. Partners typically fish in close proximity with one another in order to exchange information about shrimp availability and provide emergency assistance if needed. Social networks link captains to crewmembers and to each other through fishermen's wives, who often depend on one another for support and childcare. While fishermen stress an ideal of autonomy and independence, then, in practice the risks of a fishing livelihood make them heavily interdependent.

Interestingly, the movement against TEDs encompassed both native white and Vietnamese fishermen. Until recently, many white fishermen viewed Vietnamese immigrants as competitors for limited shrimp stocks. In some communities, Indochinese arrivals were persecuted by racial hate groups during the 1970s. By the late 1980s, however, interethnic cooperation had grown noticeably in places like Biloxi (Campany 1990:28) and Bayou La Batre. In part greater acceptance of southeast Asians has developed from the multiethnic composition of the CSA and the broader movement against TEDs. Among white Bayou La Batre shrimpers, 47.4 percent stated that relations between American and Vietnamese fishermen had improved as a result of the TED issue. Some fishermen confessed that their opinions of Vietnamese were changed by their involvement in the Port Aransas blockade, which made them realize, in the words of one informant, 'that we're all in the same boat now.'

### The Genesis of Resistance

Shrimpers and their foes alike were surprised by the tenacity of their opposition to TED regulations. The growth of collective resistance is in part due to the 'moral economy' foundation of their movement. As historians and anthropologists have noted in a variety of contexts (Thompson 1966; Wolf 1969; Scott 1976), the most compelling motive behind popular uprisings of the dispossessed have not usually been radical egalitarian or utopian beliefs, however much these are articulated by the leaders of such movements. Rather, it is an implicit belief in a moral 'right to subsistence' (Scott 1976:33) that has informed poor peoples' movements throughout history. From this 'moral economy' viewpoint, any claim by the powerful that diminishes the ability of the poor to meet their subsistence needs is considered unjust. Under colonialism, imposed changes in land tenure and taxation often violated peasants' perceived right to a livelihood and provoked vehement resistance. Such sentiments culminated in revolutions that transformed the contemporary world (Wolf 1969).

Resistance movements based on a 'moral economy' ethic have not been limited to rural peasantries nor to nonmarket economies in which 'subsistence' is measured solely according to biological and caloric minima. In industrialized societies, perceptions of

injustice arise when living standards decline and the chance of upward mobility is foreclosed for significant sectors of the population (Piven and Cloward 1979). Fishermen, too, have repeatedly organized collective defense against outside intrusion on traditional fishing practices (Taylor 1987; Durrenberger and Pálsson 1988). Where technological changes or alterations in resource access and management are seen to threaten the subsistence rights of community members, fishermen have joined together in formidable movements of self-defense (Byron 1980).

A comparable 'moral economy' dimension may be discerned in the resistance movement against TEDs. Faced with spiraling operating costs and declining prices for their products, many shrimp fishermen were already operating at a break-even point by the mid-1980s. Shrimpers initially sought individual solutions to their economic problems. Many responded to rising costs and declining prices by leaving the industry when possible; otherwise, they reduced operating costs, intensified work effort, and ultimately accepted reduced living standards.

With such strategies already in place at the time of TED regulations, most shrimpers had little additional ability to absorb the losses associated with TEDs. With the exhaustion of individual responses, the growth of collective opposition became the final recourse open to shrimpers. The few options available to shrimpers faced with a crisis of livelihood also account for the acts of desperation that have characterized the movement, such as spontaneous civil disobedience, vows to defy the law, and the public burning of TEDs. Under the circumstances, many shrimpers have felt that they have little left to lose. Fishermen and their families express a nearly palpable frustration at their inability to remain in business despite such sacrifices. The comments of the wife of one fishermen with 23 years of experience were typical in this respect:

It seems like its something that being forced on us because if it wasn't for the imports and those TEDs they could go out there and make a living...I mean its not like they've robbed the Gulf of shrimp. The shrimp are there, but they have to let half of them go in their nets and then when they bring what do get they don't get any price because [processors] can buy imported shrimp so cheap (Thomas 1990:31)

In other fisheries, resistance is often directed against regulatory policies perceived to be unfair (Gale 1991). Fishermen do not consider external management of resources to be unjust in itself, but policies that do not equitably share the burdens of management are often deeply resented (Schweri and Van Willigen 1984). Such perceptions of injustice underlie much of the opposition to TEDs, for shrimpers believe that they are being forced to assume exclusive responsibility for turtle conservation. Fishermen conclude that it is only their comparative political powerlessness that accounts for the government's imposition of TED regulations while it fails to regulate beachfront real estate development, offshore oil drilling, and ocean waste disposal. Given such perceptions of unfairness, it is not surprising that many shrimpers attribute a conspiratorial intent to TED regulations. Many shrimpers believe that the regulations are a convenient pretext for excluding them from coastal areas highly desired by more influential groups, such as developers, recreational fishermen, oil companies, and waste disposal firms. As evidence, they point to the close, if paradoxical, relationship existing between some environmental organizations and corporate donors, which include some of the largest polluters in the Gulf of Mexico (cf. Pell 1990).

Pollnac (1981) has noted that rules perceived as unfair can cause reactions that undermine resource management itself. Fishermen in Gloucester, Massachusetts, defied many of the provisions of the Groundfish Management Plan for New England fisheries, which supplanted earlier informal management practices developed by fishermen themselves (Miller and Pollnac 1978, Miller and Van Maanen 1979). Among the effects of opposition to outside management were surreptitious violations of regulations and falsification of landings records (Appolonio 1978).

Here, too, the literature on peasant resistance illuminates fishermen's behavior and attitudes on the TED issue. In many agrarian settings, collective rebellion may be a dramatic form of resistance, but it is also the most easily repressed. Having learned this fact from painful experience, the powerless usually resist authority with surreptitious actions of noncompliance. In the aggregate, individual acts of disguised insubordination often accomplish at least as much as collective resistance, without the risks of detection and repression. Foot dragging, dissembling, 'defensive ignorance,' and artful sabotage have 'nibbled to extinction' (Scott 1985:31) countless policies that the poor perceive as injurious to their interests. Such forms of 'everyday resistance' characterize peasant responses to all varieties of inequitable land tenure and political domination (cf. Colburn 1989). Far from being solely an agrarian or Third World phenomenon, surreptitious noncompliance may be the last resort of those who find themselves otherwise politically powerless. Among the acts of North American fishermen, blockades and civil disobedience are the most visible forms of resistance to TEDs, but they hardly exhaust all possibilities. Rather than ending fishermen's resistance to TEDs, the decision to enforce the regulations merely shifted opposition to less easily detected forms.

Violation of TED laws by shrimp trawlers is punishable by an \$8,000 fine on the first offense as well as seizure of nets and shrimp catch. Subsequent offenses are punished with uncompensated seizure of boats and equipment. Coast Guard enforcement is reportedly stringent in some areas, some shrimpers claiming that their boats have been boarded and inspected at gunpoint. Fishermen nonetheless continue to violate the law as they earlier vowed. Nearly ten percent of the offshore shrimpers in Bayou La Batre admit that they do not use TEDs while shrimping as legally required. Given the legal consequences of such behavior, actual rates of noncompliance are undoubtedly higher than self-reports would indicate.

Shrimpers often disrupt enforcement by warning other fishermen via radio of the location of Coast Guard inspection parties. Others nominally comply with the regulation but circumvent it in discrete ways. Due to the severe penalties for trawling without TEDs, 10.3% of the fishermen in Bayou La Batre resort to the less easily detected strategy of sewing shut the turtle exits on TEDs. These acts are not intended to trap turtles, but to prevent a complete loss of shrimp when TEDs begin to clog. While TEDs are visible in shrimp nets from some distance, the practice of sewing them shut can be detected only upon close inspection. Coast Guard teams have to board such vessels to determine that they are in violation of the law. Although this occasionally happens, more often compliance is monitored at a distance, where illegal modifications cannot be seen. Despite the penalties of TED violations, nearly 20 percent of those fishermen required to use TEDs admit to defying the law either openly or clandestinely.

A more disturbing possibility is that some will direct their frustration with TED regulations toward sea turtles themselves. Noncompliance and evasion usually result

from unpopular forms of material domination, e.g. taxation, rent, and forced deliveries of crops (Scott 1989:27). The powerless respond in more aggressive fashion to denial of status and humiliation by the powerful. Here is the 'hidden transcript of anger' by which the poor answer indignities suffered at the hands of elites (ibid.). From symbolic rebellion in ritual and folk tales to actual arson, destruction of machinery, and murder through poisoning or ambush, the powerless retaliate against those who would deny them self-respect. Beneath the public veneer of deference expected of the poor, then, there is often frustrated aggression that cannot be permanently contained. Such frustration is evident among fishermen who feel powerless before distant officials and an unsympathetic press, neither of which seem to acknowledge their concerns.

Despite their objections to TEDs, shrimpers argue that they were sympathetic to sea turtles in the past, stating that they, too, have a right to a healthy marine environment. Shrimpers contend that they formerly resuscitated unconscious sea turtles caught in their nets, while noting that the Endangered Species Act prevents them from doing so at present.<sup>6</sup> Despite shrimpers' denials, the media occasionally suggest that shrimp fishermen intentionally kill sea turtles stranded in their nets (cf. Williams 1989). In one highly publicized case in Florida, a shrimp captain was led to jail in handcuffs after a former deckhand claimed that he was fired for refusing to slit the throats of captured turtles. It was subsequently learned that the deckhand had fabricated the accusation after being fired for drug use while working (Anonymous 1990a:2). Nonetheless, there occur sporadic reports of mutilated sea turtles washing up on beaches along the Atlantic coast. While the perpetrators of these acts have not been identified, it is possible that they represent a form of protest against TED regulations. However drastic, the killing of turtles does not surprise coastal residents familiar with the desperation of fishermen in the current economic and regulatory climate. If these actions are the 'weapons of the weak' that Scott discerns in the acts of the powerless, then the intent of TED regulations threatens to be quietly subverted by the tide of frustration and resentment they have engendered.

## Conclusions

Shrimp fishing, particularly as represented in communities like Bayou La Batre, is not only the basis of livelihoods along the Gulf of Mexico, but comprises a distinctive American subculture. Since the late nineteenth century, when local commercial fisheries were established, Bayou La Batre has developed a unique set of economic activities and social relationships based upon the natural, technological, and social cycles of shrimp fishing. The distinctive character of the community derives in large part from this occupational specialization and the relationships of mutual dependence between captains, crews, families, and firms that develop from it (Thomas and Formicella 1987). While cities such as Biloxi generate considerable employment outside the shrimp fishery, in Bayou La Batre the economic well-being of at least 75% of all local employment sources are directly linked to the shrimp industry (ibid.). When that fishery is threatened with extinction, so is a coastal subculture. It is not coincidental that when asked in an open-ended question what they feared the most from TED regulations, approximately 70 percent of Bayou La Batre shrimpers volunteered 'losing our way of life.'

While the high catch losses associated with TED use do threaten this way of life, TED regulations are only the most visible symbol of the industry's troubles. Even if the regulations were rescinded, fishermen would still have to contend with producer prices that barely meet their operating costs. The 'moral economy' perspective suggests that the industry's economic and regulatory problems are intertwined. This view not only elucidates the sources of shrimpers' resistance, but also suggests a resolution of the apparently conflicting goals of conservation and livelihood. Given their perilous economic status, any easing of the crisis facing shrimpers would also diminish their resistance to TED regulations. Shrimpers readily acknowledge this when stating that they would comply with TED regulations if they were able to continue to make a living when using the devices. At public hearings, fishermen both challenge and plead with federal officials to show them how to obtain the three to four percent shrimp losses of official TED trials so that they may legally continue to make a living.

The survival of the domestic shrimp industry, at least as a legal entity, is doubtful as long as producer prices remain depressed by unregulated shrimp importation. The federal government has repeatedly enacted 'anti-dumping' legislation to protect the domestic computer industry, garment manufacturing, and farmers of certain crops. Yet it has not considered similar provisions against imported aquaculture shrimp, despite the fact that cultured shrimp is heavily subsidized by national governments and lending agencies. Policies that would prohibit shrimp imports from countries lacking TED laws and impose tariffs on imported shrimp sold below market value admittedly entail consumer costs. In distributing the costs of turtle conservation across all sectors of society, however, such initiatives would also greatly lessen the perceived unfairness of TED regulations.

With the development of a resistance movement shrimpers assert the claim that if turtle conservation is to be a societal goal, then it must be a societal cost as well. Fishermen consider it inherently unfair to impose such costs exclusively upon a small sector of the population that is already struggling to earn a living. In the absence of incentives for TED use, shrimpers' probable response to TED regulations will be continued open and covert defiance. Besides inevitably raising government enforcement costs, the silent evasion and sabotage practiced by thousands of shrimpers may undermine the goal of conservation policies. Alternately, policies that provide far greater incentives for TED use and development hold out the only genuine possibility of preserving both marine turtles and coastal communities that follow a way of life based on shrimp fishing.

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## Notes

1. Research in Bayou La Batre was begun by J. Stephen Thomas in 1985. Thomas' research entailed 261 interviews with shrimp captains in 1985 and 1987, followed by our interviews with 68 shrimpers in 1990. Because 40 of Thomas' original informants were reinterviewed in 1990, the research affords documentation of the same individuals prior to and following the introduction of TED regulations. As part of a cross-sectional comparison, the research was extended to Biloxi in 1990, where an additional 40 shrimpers were interviewed. The original sampling procedure entailed dockside encounters with fishermen as they boarded or disembarked from their boats. This procedure was nonrandom but resulted in interviews with virtually all native fishermen based in Bayou La Batre. Due to the absence of trained interpreters, only two bilingual Vietnamese captains could be interviewed, out of an estimated 15 Vietnamese offshore fishing operations in the Bayou.

2. Shrimpers greet these claims with incredulity. Many Gulf of Mexico shrimpers contend that individually they have captured only a few turtles in many years of fishing. Fishermen claim that the turtle capture estimates presented in the National Academy of Sciences report represent faulty extrapolations. Areas of dense turtle populations (such as Cape Canaveral) provided the basis of turtle capture estimates for the south Atlantic and Gulf of Mexico, where shrimpers contend that they encounter few sea turtles. In direct observations of 540 trawls during the 1970s, White (1989:70) recorded six turtles captured in offshore waters of the Gulf of Mexico. Extrapolations from Cape Canaveral data, however, would predict the capture of 9,681 turtles during this number of trawls (*ibid.*). NFMS data presented in a 1991 committee hearing tend to corroborate these findings: on observer vessels operating between 1978 and 1990, turtle capture rates per 1,000 hours of trawling averaged 38.7 in the south Atlantic but only 2.8 in the Gulf of Mexico.

3. At public hearings in Louisiana and at subcommittee hearings in Washington, NMFS officials in 1990 and 1991 presented data indicating that TEDs have no statistically significant effect on shrimp catches. Failure to adopt recent TED designs was publicly attributed by one such official to 'a certain reluctance to innovate among many shrimpers.' Similarly, a prominent environmental magazine noted that shrimpers resisted TEDs despite the improvements made since the first designs were introduced in the early 1980s. The reason for such 'stubbornness,' according to the account, was that 'shrimp captains like to fish the way their daddies fished' (Wille 1987:2).

4. In contrast, our research indicates that shrimpers have engaged in extensive experimentation with TEDs on their own. Only 17.9% of the fishermen surveyed in Bayou La Batre reported that they did not try out or modify different TED designs before adopting one to comply with the law. At a cost of \$300 or more per TED (not to mention the costs of shrimp loss during unsuccessful trials and down-time during installation), such experimentation represents a substantial expenditure of time and money. Several Bayou La Batre shrimpers report spending up to \$3000 in conducting trials with different TED designs.

5. Informants were asked to evaluate their life satisfaction at the time of interview on a ten point scale known as Cantril's 'Ladder of Life.' This provides a widely-employed measure of optimism and psychological well-being (Miller 1983). In 1985, the average Ladder of Life ranking was 6.7, but among the same informants in 1990, the rank fell to 5.2. When asked to anticipate their life status in five years' time, informants in 1985 exhibited some optimism, predicting a slight improvement to 6.8. A similar question in 1990 elicited highly pessimistic assessments of the future, shrimpers on average predicting a decline in life status to a level of 4.1. 43.9% of the shrimpers interviewed in 1990 accounted for their present life status in terms of financial losses and declining incomes from fishing.

6. As Durrenberger (1991) notes, the absence of collective movements among Gulf of Mexico fishermen in recent years is a consequence of legal intervention in the shrimp fishery, rather than the psychological attributes of shrimpers. In the late 1940s, area fishermen joined the Gulf Coast Shrimpers and Oysterman's Association, which collectively negotiated seafood producer prices with processors (Durrenberger 1991:4). The union was dissolved under the Sherman Antitrust Act in 1955.

7. The National Marine Fisheries Service provided instruction on turtle revival techniques to shrimpers in the 1970s. White's observations suggest that such techniques were formerly used to resuscitate comatose turtles (White 1989:70). With the subsequent extension of the Endangered Species Act to marine turtles,

fishermen are in violation of federal law and subject to a \$20,000 fine if they retain an animal on deck long enough to revive it. Unconscious turtles must now be returned to the water immediately upon capture if fishermen are to avoid the fines enforced by the Coast Guard. Ironically, animals that would have once been saved are now condemned to a greatly reduced chance of survival.

## References Cited

- Acheson, James  
1988 *The Lobster Gangs of Maine*. Hanover, NH: University Press of New England.
- Anonymous  
1990a Shrimpers Acquitted of Killing Turtles. *St. Petersburg Times*. January 14:2.
- Anonymous  
1990b Trouble in Paradise. *Commercial Fisherman* (March) 1(1):9.
- Appolonio, S.  
1978 *The New England Fishery Council: Problems and Prospects in Formulations of Marine Policy: Limitations to Rational Decision-Making*. University of Rhode Island: Center for Ocean Management Studies.
- Bailey, Conner  
1988 The Social Consequences of Tropical Shrimp Mariculture Development. *Ocean and Shoreline Management* 11:31-44.
- Byron, R.  
1980 Skippers and Strategies: Leadership and Innovation in Shetland Fishing Crews. *Human Organization* 39:227-32.
- Campany, Christopher  
1990 *An Analysis of Shrimp Fishermen Perception of Sea Turtle Conservation Measures and Their Social Impacts*. Research report. Department of Sociology and Anthropology, Mississippi State University.
- Colburn, Forrest (Ed.)  
1989 *Everyday Forms of Peasant Resistance*. Armonk, NY: M.E. Sharpe.
- Connor, Daniel  
1987 Turtles, Trawlers, and TEDs: What Happens When the Endangered Species Act Conflicts With Fishermen's Interests. *Water Log*. Mississippi-Alabama Sea Grant 7:3-27.
- Durrenberger, E. Paul  
1990 Policy, Power, and Science: The Implementation of Turtle Excluder Device Regulations in the U.S. Gulf of Mexico Shrimp Fishery. *Maritime Anthropological Studies* 3:69-86.
- Durrenberger, E. Paul  
1991 Psychology, Unions, and the Law: Folk Models and the History of Shrimpers' Unions in Mississippi. Paper presented at the 1991 meeting of the Society for Applied Anthropology (Charlestown, SC).
- Durrenberger, E. Paul and Gísli Pálsson  
1987 The Grass Roots and the State: Resource Management in Icelandic Fishing. In: B. McCay and J. Acheson (Eds.), *The Question of the Commons*. University of Arizona Press.
- Federal Register  
1987 *Federal Register* 52(124):24246.

- Gale, R.  
1991 Gentrification of America's Coasts: Impacts of the Growth Machine on Commercial Fishermen. *Society and Natural Resources* 4:103-21.
- Graham, J., E. Brown, and S. Rees  
1988 *Feasibility Report and Environmental Impact Statement For Navigation Improvements at Bayou La Batre, Alabama*. Mobile, AL: U.S. Army Corps of Engineers.
- Mialjevich, T.  
1987 Sea Turtles and TEDs: A Misdirected and Counterproductive Effort to Save Sea Turtles. *Water Log*. Mississippi-Alabama Sea Grant 7:28-31.
- Miller, Delbert  
1983 *Handbook of Research Design and Social Measurement*. Fourth ed. New York: Longman.
- Miller, M. and R. Pollnac  
1978 *Responses to the Fisheries Conservation and Management Act of 1976: The Port of Gloucester*. Interim Report for National Science Foundation Grant No. AER 77-06018.
- Miller, M. and J. Van Maanen  
1979 Boats Don't Fish, People Do: Some Ethnographic Notes on the Federal Management of Fisheries in Gloucester. *Human Organization* 38:377-85.
- N.A.S. (National Academy of Sciences)  
1990 *Decline of the Sea Turtles: Causes and Prevention*. Washington, D.C.: National Academy Press.
- Pell, Eve  
1990 Buying In: How Corporations Keep an Eye on Environmental Groups that Oppose Them. *Mother Jones* 15:23-7.
- Piven, F.F. and R. Cloward  
1979 *Poor Peoples' Movements: Why They Succeed, How They Fail*. New York: Vintage.
- Pollnac, R.  
1981 Sociocultural Aspects of Developing Small-Scale Fisheries: Delivering Services to the Poor. *World Bank Staff Working Paper*, No. 490. Washington, D.C.: The World Bank.
- Roberts, Ken  
1990 Shrimp Imports... Out of Control? *Commercial Fisherman* May 1(2):9.
- Schweri, W. and J. Van Willigen  
1984 Community Resistance to Environmental Change Projects. In: W. Milsap (Ed.), *Applied Social Science for Environmental Planning*. (Social Impact Assessment Series No. 10). Boulder, CO: Westview.
- Scott, James  
1976 *The Moral Economy of the Peasant: Subsistence and Rebellion in Southeast Asia*. New Haven: Yale University Press.
- Scott, James  
1985 *Weapons of the Weak: Everyday Forms of Peasant Resistance*. New Haven: Yale University Press.
- Scott, James  
1989 Everyday Forms of Peasant Resistance. In: F. Colburn (Ed.), *Everyday Forms of Peasant Resistance*. Armonk, NY: M.E. Sharpe.

- Stiles, R.G.  
1972 Fishermen, Wives, and Radios: Aspects of Communication in a Newfoundland Fishing Community. In: R. Andersen and C. Wadel (Eds.), *North Atlantic Fishermen: Anthropological Essays on Modern Fishing*. Toronto: University of Toronto Press.
- Taylor, Lawrence  
1987 "The River Would Run Red with Blood": Community and Common Property in an Irish Fishing Settlement. In: B. McCay and J. Acheson (Eds.), *The Question of the Commons: The Culture and Ecology of Communal Resources*. Tucson: The University of Arizona Press.
- Thomas, J. Stephen  
1990 Transcript of a focus group discussion on TEDs in Bayou La Batre. Manuscript.
- Thomas, J. Stephen and C.M. Fornichella  
1987 The Shrimp Processing Industry in Bayou La Batre, Alabama. *Research Report* No. 11. Mobile, Alabama: Center for Business and Economic Research.
- Thompson, E.P.  
1966 *The Making of the English Working Class*. New York: Vintage.
- Vidal, J.M.  
1988 *Situacion Actual y Perspectivas de la Utilizacion del Turtle Excluder Device (TED) en Mexico*. Mexico City: Instituto Nacional de la Pesca (PESCA).
- White, David  
1989 Sea Turtles and Resistance to TEDs Among Shrimp Fishermen of the U.S. Gulf Coast. *Maritime Anthropological Studies* 2:69-79.
- Wille, C.  
1987 On Refrigerators, Turtles, and Stubbornness. *Audubon Activist* 1:2.
- Williams, T.  
1990 The Exclusion of Sea Turtles. *Audubon* (January) 24-33.
- Wolf, Eric  
1969 *Peasant Wars of the Twentieth Century*. New York: Harper and Row.