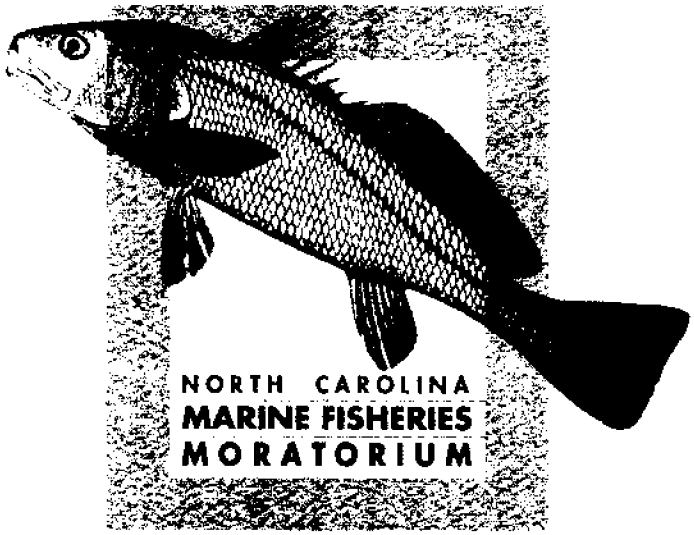

FISHERIES RESEARCH REPORTS TO THE FISHERIES MORATORIUM STEERING COMMITTEE

Impacts of New Regulations on North Carolina Fishermen: A Classificatory Analysis

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A Classificatory Analysis

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Final Report
to
The North Carolina Fisheries Moratorium Committee

Based on Work Conducted in Accordance with the Proposal Entitled

Identif ying and Defining Fishers and Gear in North Carolina to Develop Licensing as an Effective Management Tool

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Abstract

The findings presented here derive from eight months of research designed to address the following objectives:

1. To develop a classification system that identifies and defines North Carolina fishers in terms of dependence on the resource, gear type, effort, motivation for fishing, and core and secondary species they target

2. To determine how different groups of fishers will be impacted by different regulatory scenarios

3. To evaluate North Carolina's licensing system in terms of its ability to monitor numbers, characteristics, and behaviors of commercial and recreational fishers

4. To assess the experiences of other states in developing and administering licensing programs

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IMPACTS OF NEW REGULATIONS ON NORTH CAROLINA FISHERMEN

I. Executive Summary

The findings presented here derive from eight months of research designed to address the following objectives:

1. To develop a classification system that identifies and defines North Carolina fishers in terms of dependence on the resource, gear type, effort, motivation for fishing, and core and secondary species they target;
2. To determine how different groups of fishers will be impacted by different regulatory scenarios;
3. To evaluate North Carolina's licensing system in terms of its ability to monitor numbers, characteristics, and behaviors of commercial and recreational fishers;
4. To assess the experiences of other states in developing and administering licensing programs.

Accomplishing these objectives involved several phases of field research and analysis, all of which were oriented toward gaining a view of North Carolina fishing—commercial and recreational—from a variety of perspectives. Because of the highly politicized environment of the past two years, it was necessary to triangulate our data sources to reduce respondent bias. Thus, we used a variety of methods to cross-check, assess, and validate information received from different sources representing different political and economic interests in the fisheries. Our respondents included: a) recreational anglers whom we located through sportfishing lists, DMF data, and an intercept methodology; b) charter boat captains and pier owners; c) commercial fishermen and their families all along the coast and throughout the Albemarle-Pamlico Estuarine System; c) seafood processors and seafood processing workers; and d) fishermen and marine regulatory personnel in North Carolina and in 12 other states. Our methods of observation and data collection included: visits to fishing centers around the state (cultural mapping); surveying individuals in other states regarding their licensing programs and experiences, including government officials and fishermen; surveying recreational fishermen, charter boat captains, and pier owners; conducting in-depth interviews with commercial fishers; and eliciting feedback from

members of fishing families concerning regulatory and other social problems in the context of focus groups.

Findings: Recreational Fishing in North Carolina. Data collected at North Carolina fishing locations, through club lists, and through DMF licensing information revealed that slightly under half (48.3%) of the recreational fishermen oppose a saltwater recreational fishing license; while 24.7% support such a license unconditionally and another 27% support licensing under the condition that the fees collected be returned to the recreational fishing community in the form of stock enhancement or other beneficial programs. Support for a recreational fishing license varied by club membership: members of fishing clubs were more likely to support a saltwater fishing license than independent anglers. Club membership is an accurate predictor of fishing location (shore, structure, or boat) and attitudes toward the resource and toward commercial fishermen: club members were more likely than independents to fish from private boats and to blame commercial fishermen for stock depletion problems (as opposed to pollution and habitat destruction); independents are more likely than club members to view sportfishing pressures on fish stocks as problematic and to consider fishing regulations as unevenly borne by commercial fishermen.

These distinctions may be related to the counties of residence of fishermen who fell into the independent category. We located most of the independents through an intercept methodology, and thus they are more likely to live in coastal counties than club members, who were distributed across the coastal plain and the state. Recreational fishermen from coastal locations are, in general, far more cognizant of water quality problems and thus less likely to place the full burden of blame on commercial fishermen for stock depletion problems.

Recreational fishing effort was not easily predicted by club membership or fishing location, with most anglers reporting that they fished around 40 days per year; age was the best predictor of fishing effort: simply, older people fish more than younger people.

Findings: Commercial Fishermen. We interviewed fishermen in five regions of the state: Southern, Carteret/Middle Eastern, Pamlico/Middle Western, Albemarle, and the Outer Banks/Eastern Dare regions; and held focus groups in the first four of these regions. Comparative analysis revealed a fairly high degree of regional variation in the fisheries and in the problems facing fishermen. In terms of gears, we found that distinctions between inland, estuarine and

barrier island/ coastal fishing practices are more different than distinctions between the southern and northern regions of the state. In general, fishermen in inland regions are more specialized and more heavily dependent on trap fishing than fishermen living closer to the Atlantic; the latter are, as well, somewhat more flexible and diverse in their ownership of vessels, their uses of gears, and their target species, depending on various kinds of nets, shrimp and fish trawls, long lines, and, when fishing in inside waters, traps and pound nets.

Fishermen in all regions expressed deep concern over water quality and crowding problems, but the specific dimensions of these problems also varied across regions. For example, fishermen in the Pamlico region were concerned about nutrient loading in the Neuse River, pollution from phosphate mining, and the recent discovery of the toxic dinoflagellate known as *pfiesteria picimorte.* Fishermen in the southern region were concerned about damaged substrates due to beach reclamation, while fishermen in the Albemarle were concerned about discharge from pulp mills. Fishermen in all regions except Eastern Dare were concerned about the growth of contract hog production east of I-95 and its related pollutants.

The social problems involving fishermen are less diverse across regions, but still vary regionally. Fishermen in all regions expressed the belief that commercial fishing and the fishing way of life are being increasingly overregulated and, in some cases, unjustly criminalized. They perceive DMF enforcement as uneven and biased and perceive a breakdown of communication between DMF and the commercial fishing community. Public hearings and workshops have not provided adequate forums for feedback, at times intimidating fishermen with formal procedures and demands on their public speaking abilities. All fishermen suffer from some incursions on their fishing practices by recreational and leisure interests, including real estate development causing access problems and organized recreational fishing interests lobbying against certain gears and for increasing recreational allocations of fish stocks. Finally, in some regions of the state, there have been tensions between fishermen and dealer/processors over the organization and deployment of fishing fleets.

Findings: Classification System. The data and information compiled by this study suggest seven classes of fishermen that fall into the two broad categories of recreational and commercial fishermen. The first four categories are commercial fishing classes and the last three are recreational groups. These include:

1. Full-time, owner-operator fishermen. This is the group that depends heavily on fishing as their primary source of income and whom the committee has expressed desire to protect as "professional" fishermen. Recent accounts place their numbers between 1,700 and 1,800 individuals.
2. Full-time, fleet fishermen. These are fishermen who are similar to class # 1 fishermen, except fish primarily for seafood dealers or processors, sometime fishing dealers/processors' gear from dealer/processors' vessels.
3. Part-time, retired/poor fishermen. These individuals rely on the marine resources of the state to supplement retirement incomes or lift them above poverty levels. Few full-time fishermen wish to see these fishermen suffer under new restrictions on fishing and sales of seafood.
4. Part-time fishermen with full-time shore-based employment. This group constitutes the most problematic for fishery managers under current political conditions. Most full-time fishermen view these individuals as primarily responsible for the crowding problems and for problems associated with unattended gear.
5. Professional Recreational Fishermen: Pier Owners and Charter Boat Captains. These individuals, generally, oppose saltwater recreational fishing license proposals, with the former viewing it as an assault on their business and the latter viewing it as simply another tax. They agree, however, that there is a need for fees for improved enforcement of regulations and for enhancement of the fisheries.
6. Independent recreational fishermen. These are fishermen who do not belong to recreational fishing clubs. In general, they are more tolerant of commercial fishing practices, and less in support of a license, than recreational fishermen who belong to clubs.
7. Affiliated recreational fishermen. These individuals tend to be more hostile toward commercial fishing interests, probably due to inflammatory literature produced by various recreational fishing interests, yet are more cognizant of their need to support the resource with fees through licensing.

We conclude with a consideration of regulations in other states, focusing in particular on the state of Maine. Maine and North Carolina share several social and ecological characteristics and thus Maine's model of regional councils may be particularly relevant to the regional distinctions that currently divide North Carolina fisheries.

II. Introduction: General Characteristics of North Carolina Fisheries

a. Cultural Mapping of North Carolina's Coastal Zone

We included information from the cultural mapping in previous reports and here reproduce most of our earlier observations. Table 1 shows the 25 sites we visited, with some associated characteristics. We encountered nothing in later phases of field research to alter our earlier conclusions, which include:

- First, most obviously, the busiest fishing season for almost all sites visited begins in the spring and lasts through summer, with December through February being relatively quiet in most locations. Exceptions to this are the fisheries of the Outer Banks, which tend to be net-based and to target winter species.
- Second, despite the fact that we find a number of extremely large vessels in the state, crews on most vessels tend to be small (<45'), as indicated by comparing the number of vessels at each site with the number of fishermen who use each site. Most crews consist of between one and three fishermen and many fishermen we interviewed fish alone. The menhaden fishery, of course, is an exception to this (Garrity-Blake 1995).
- Third, relatively few sites we visited specialize in only one species, one type of gear, or one type of vessel. Crab pots and shrimp or otter trawls rank high among the principal gears used in the state, but others tend to be found in use alongside these either by the same fishermen or by others using the same docking and other facilities.
- Fourth, few full-time, owner-operator North Carolina commercial fishermen rely on a single species or single gear for their livelihood, and many operate from more than one vessel; indeed, this diversity and flexibility constitutes one of the central defining characteristics of a full-time fisherman in North Carolina. Combined with the previous finding regarding the lack of specialization in the industry, this feature of North Carolina's fisheries differentiates it from other state fisheries and leads us to consider with caution the applicability of regulatory decisions and licensing programs in other states. Small crew sizes, especially those based on family and community relations, are adaptive under these conditions, where shifting among fishing gears and locations does not depend on mobilizing large numbers of crewmen.

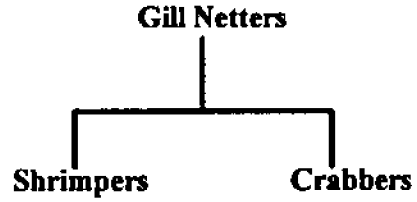
Table 1. Selected Features of Sites Visited During Cultural Mapping

Town	County	Principal Activity	N Fishers	N Vessels	N Employ	Principal Gear	Active Season	Slow Season
North Shore, Pamlico River & Sound								
S Quarter	Hyde	CP/ Pl	60	60	7	Pots	Apr-Oct	Nov-Mar
S Quarter	Hyde	CF/Cr	17	17	7	Pots	Jun-Sep	Oct-May
Englehard	Hyde	SfdS	36	12	23	O Trawl	Aug-Sep	Nov-Dec
Englehard	Hyde	SfdS	50	40	14	O Trawl	Apr-Aug	Sep-Dec
Belhaven	Beaufort	CP	0	0	150	n.a.	Apr-Oct	Nov-Mar
Rose Bay	Hyde	SfdS/OP	21	17	27	Pots	All year	n.a.
Germantn	Hyde	CP	3	3	23	Pots	May-Sep	Dec-Feb
Outer Banks								
Ocracoke	Hyde	CF/Cr/Sfd	100	50	3	P nets	Apr&Oct	Dec-Jan
Hatteras	Dare	RF/Ch/CF	46	33	19	HookLine	Apr-Nov	Dec-Mar
Hatteras	Dare	CF/Ch	12	6	n.d.	Gill net	Sep-Mar	Summer
Wanchese/Southern Albemarle/Alligator River								
Wanchese	Dare	CF	28	n.d.	n.d.	Lgnln/gnet	All year	
Alligator R	Dare	Cr	10	10	0	Pots	Summer	Winter
Down East								
Atlantic	Carteret	CF/SfdS	50	40	23	O Trawl	Sep-Jan	Mar-May
Stacy	Carteret	CF/SfdS	40	25	8	PNet/pots	Mar-Dec	Jan-Feb
Beaufort	Carteret	CF	21	54	46	O Trawl	All Year	
Pamlico Peninsula								
Aurora	Beaufort	CP	63	42	32	Pots	Apr-Nov	Dec-Mar
Vandmere	Pamlico	CP/CF	16	6	n.d.	Trawl/pots	Apr-Oct	Jan-Mar
Paradise	Pamlico	Cr/Pl	4	2	4	Pots/peel	Apr-Oct	Jan-Feb
Central								
Sneads Fy	Onslow	CF/SfdS	31	17	4	O Trawl	Jun-Nov	Jan-Mar
Sneads Fy	Onslow	CF/SfdS	17	11	1	Gill nets	Apr-Jan	Feb-Mar
Sneads Fy	Onslow	CF/SP/Sh	50	25	2	O Trawl	Apr-Oct	
Salter Pat	Carteret	ScP	12	6	27	S Dredge	Dec-Mar	
Southern								
Varnamtn	Brunswick	Shr/CF	17	7	2	O Trawl	Jun-Aug	Jan-May
Hampstd	Onslow	Clam/Oys	5	7	0	Gnet/pot	All year	
Hampstd	Onslow	CF/Sh	21	35	2	O Trawl	Apr-Nov	August

CP=crab processing; Pl=peeler operation; CF=Commercial fishing; Cr=Crabbing; SfdS=Seafood Shipper & Dealer; RF=Recreational Fishing, FP=Finfish processing; Shr=Shrimping; OP=oyster processing; Ch=Charter boat; SP=sprimp processing;ScP=scallop processing

- Fifth, this diversity and flexibility has some implications for managing the fisheries of the state. Although fishermen tend to be defined by the *primary* species they target and gears they use to capture those species, such as shrimpers using otter trawls or crabbers using crab pots, North Carolina fishermen become more alike one another, often, in the *secondary* species they target and, in particular, the gears they use for those species. Fishermen who call themselves shrimpers and fishermen who call themselves crabbers, for example, both tend to use gill nets to fish either for bait or for fish such as flounder, mullet, croaker, and spot. Whereas it may seem most sensible to classify fishermen in the state as either shrimpers, crabbers, long-liners, etc., it may be more accurate to classify them in terms of a hierarchy that illustrates that more North Carolina fishing families use gill nets than use either crab pots or shrimp trawls, as follows:

Figure 1. Hierarchical Illustrating Relationship Between Secondary and Primary Gears in North Carolina Fisheries



- Sixth, North Carolina fisheries are highly localized. The sites listed in table 1 and detailed later on maps illustrate the diversity of types of operations even within relatively confined areas. Those sites with access to both inland and off-shore waters, such as fishermen based in Wanchese or the Outer Banks or Carteret County, have more options available to them to shift among fisheries and even between recreational and commercial sectors (such as operating as charter boat fishermen) than fishermen based along the Pamlico River or Albemarle Sound. Some fishermen, recognizing the advantages to these different locations, dock boats at more than one location or utilize more than one launching and landing facility. However, several fishermen we interviewed had little or no idea about the character of fisheries fewer than fifty to sixty miles away.
- Seventh, regional differences occur among the fisheries as we move from North to South, yet are more pronounced as we move from East to West. For example, those fishermen who fish

in the Albemarle Sound are more like fishermen of the Pamlico River than they are like those who operate out of Wanchese. Urban and rural distinctions also figure into these differences, fishing strategies of around the Nags Head/Manteo more similar to Morehead City and Wilmington fishing strategies than they are toward those of Eastern Dare further down the Outer Banks. Indeed, we use proximity to urban areas as a way of differing groups of fishermen from one another.

- Finally, with the exception of crab processing plants, most shore sites are staffed by relatively few people on land; most of the work of off-loading, icing, and other handling of the catch is done by fishermen.

The maps that accompany the section on commercial fishing, below, include information from the 25 sites we visited, showing fishing locations servicing over fifty vessels and locations servicing under five. A list of principal species handled at the sites includes all those that are commercially valuable; key informants at most sites reported between three and seven major species being landed or handled.

The sites we visited represent most of the common coastal locations that organize and focus fishing excursions in the state:

1. fish houses, that ice and pack fish and shellfish for shipment;
2. processing establishments, that cut fish, pick crabs, or shuck scallops or oysters;
3. clusters of fishing vessels and gear, usually near launching facilities such as ramps or service centers such as marinas; and
4. private family fishing locations.

These four types of sites represent most of the commercial fishing locations in the state. They constitute what Antonius Robben calls cultural foci, anchoring, directing, and orienting fishing behaviors in ways that both confine fishermen to specific territories and fishing practices and provide them with opportunities to expand those territories and fishing practices: "Cultural foci," writes Robben, "are material objectifications of cultural practices. They orient practices in material ways, just as the separation of the sleeping quarters of captain and crew directs the social interaction aboard ship" (1989: 16). In this study, we incorporate them into our classification system, finding that the character of one's landing and docking arrangements reflect a fisherman's

relationship to the processing and dealer sector and exert some influence over his or her fishing behaviors and vulnerability to regulations.

Most of the sites we visited are family owned and operated, although some include large populations of people tied to the enterprise by employment rather than kinship. The presence of large numbers of employed captains or seafood workers constitutes one of the principal features distinguishing between family-owned-and-operated and family-owned (but not wholly family-operated) firms. At each site, we solicited comments about the problems associated with fishing site. Summarized, these comments fall into five general categories:

1. Comments reflecting dismay over competition and conflict between leisure uses and commercial uses of the coast. Given that these are centers of commercial fishing activity, it may not be surprising that most of the problems associated with these sites derive from somewhat strained relations with leisure uses of the coastal environment. This is not confined to conflicts between recreational and commercial fishermen, but includes difficulties deriving from navigational problems, space, and different views about coastal development and aesthetics.
2. Comments reflecting prevailing beliefs about the habits of fish, such as the idea that fish populations go up and down in cycles (often a seven-year cycle).
3. Comments reflecting economic attributes of the fisheries.
4. Comments reflecting an interest in preserving the family heritage of fishing.
5. Comments reflecting the frustration of fishermen with regulations that seem to them senseless or politically motivated.

Regarding the probable impacts of various regulations and licensing requirements, several of the quotes suggest that fishermen desire assurances from the state that the sacrifices fishermen are forced to make are for the protection of the resource instead of the protection of one interest group over another, such as dealers/processors benefiting at the expense of family fishermen, recreational fishermen benefiting at the expense of commercial fishermen, or trawlers benefiting at the expense of trap fishermen. Most observers of North Carolina fishing families agree that there exists a crisis of legitimacy in fishery legislation in this state: that is, both commercial and recreational fishermen are extremely suspicious that there are hidden long-term agendas behind regulations designed to alter, radically, current and future fishing practices, and that these agendas

do not necessarily assure the continued health of the state's marine resources. Rule-making has been accompanied by fairly superficial attempts to educate or convince commercial fishermen about the utility of certain season closures, bed closures, or even the moratorium itself, leaving them wondering about the logic of the direction of regulations.

b. Regional, Historical, and Ecological Considerations

Historically and prehistorically, the Neuse River served as a natural and social boundary between the northern and southern sections of North Carolina's coast, separating the Albemarle-Pamlico Estuarine System (APES) from the waters between Beaufort Inlet and Little River Inlet along the North Carolina-South Carolina border. Before the Colonial period, southeastern North Carolina constituted the northernmost territory of the Siouan peoples whose affiliated ethnic groups reached southward across the Savanna River, while northeastern North Carolina constituted the southernmost territory of the Algonquin-speaking peoples who extended as far as the Great Lakes and Canada (Swanton 1946: 254-55; Phelps 1983: 26-27).

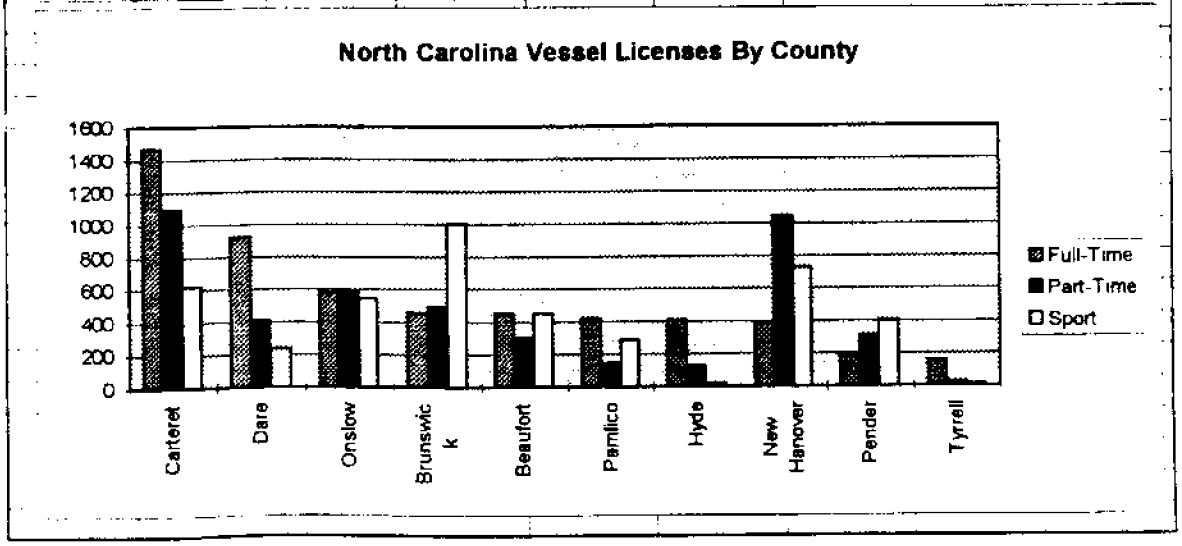
Prehistoric settlement patterns may seem to have little relevance to the North Carolina we know today, yet cultural ecological studies of Native Americans suggest that, before European colonization, they expanded and contracted their territories based on natural fluctuations in floral and faunal populations (Steward 1956). Thus these ancient divisions between north and south reflect very real environmental distinctions that influence the composition of today's commercial and recreational fishing populations.

Clearly, the fisheries north of the Neuse are far more internally diverse than those to the south, a point illustrated by the fact that four of the five fishing areas identified by Johnson and Orbach fall either wholly or partially inside the APES (Pamlico, Eastern Dare, Carteret, and Albemarle). The Johnson/Orbach classification system differentiates between areas based primarily on fishing strategies associated with primary gears or gear clusters. Data on the regional distributions of licensed vessels and seafood processors and dealers also demonstrates some bias toward the APES, but somewhat less clearly than the Johnson/Orbach classification system would suggest. I have included on this table figures showing the ratios of part-time commercial to full-time commercial vessel licenses (P/F ratio, far right column), which varies from county to county along with the degree of urban development. That is, counties like Hyde and Pamlico have

relatively low ratios of part-time to full-time licenses, while in highly urbanized counties, such as New Hanover, there are nearly three part-time licenses issued for every full time license.

Figure 2. North Carolina Vessel Licenses By County

County	Commercial Licenses			Other Licenses		Seafood		P/F Ratio
	Full-Time	Part-Time	Sport	Charter	Headboat	Process	Dealer	
Carteret	1467	1096	618	73	3	13	137	0.74
Dare	921	405	235	70	3	10	91	0.44
Onslow	577	588	542	6	1	0	51	1.02
Brunswick	455	494	1002	19	2	6	102	1.08
Beaufort	452	300	447	0	0	8	57	0.66
Pamlico	418	147	282	1	0	11	45	0.35
Hyde	408	123	21	8	0	7	37	0.3
New Hano	384	1046	729	16	1	7	54	2.7
Pender	186	310	398	2	0	2	41	1.66
Tyrrell	156	27	11	0	0	1	7	0.17
Craven	114	276	645	3	0	1	15	2.48
Currituck	113	145	111	1	0	4	21	1.28
Pasquotan	89	89	45	2	0	4	9	1
Chowan	57	72	13	0	0	2	6	1.38
Perquimm	57	47	37	0	0	0	5	0.82
Washingto	39	20	83	1	0	1	5	0.51
Camden	37	24	45	1	0	1	5	0.64
Wake	27	80	281	9	0	0	2	2.96
Duplin	16	47	165	0	0	0	1	2.9
Pitt	15	58	464	2	1	0	4	3.86
Bertie	10	16	70	0	0	1	3	1.6
Jones	10	39	61	0	0	0	2	3.9
Columbus	9	63	416	1	0	0	5	7
Lenoir	6	39	285	2	0	0	1	6.5
Roberson	6	11	184	1	0	0	1	1.83
Bladen	5	11	115	0	0	0	1	2.2



Two other, related ways to group fishers within this diverse ecological region, based on interviews and observations made during cultural mapping and in related research, include spatial considerations, such as the difference between fishing operations that are concentrated around seafood processing/marketing facilities and operations dispersed along protected waterways. Organizational differences define different classes of fishing operations as well, such as those that are household-organized as opposed to fisheries organized by seafood dealers or processors.

Neither of these classification criteria necessarily imply specific species sought, annual rounds, fishing strategies, or even gears and vessels used. Nevertheless, we can illustrate this distinction simply by comparing the industrial docks at Wanchese or Beaufort Inlet and crabbers moored at individual private docks or in small clusters along creeks, such as those found throughout the two huge peninsulas separated by the Pamlico River between the Neuse and the Albemarle Sound. These distinctions become important in so far as these factors influence behavior, including response to new regulations. Historical evidence suggests that, in fact, these spatial patterns and organizational features may well entail other behaviors.

North Carolina's principal fisheries have changed considerably through time, yet certain historical continuities thread through the fishing lifestyles we find on the coast from prehistoric and colonial times to the present. Some of the crabbing, eeling families who inhabit the swampy regions of Hyde County depend on the flora and fauna of the Tidewater nearly as completely as the Algonquin peoples who inhabited Eastern North Carolina long before the birth of Virginia Dare. John Forest's 1980s account of Tidewater North Carolina (1988) describes a community of people whose livelihoods depended on combining commercial crabbing, eeling, gill net fishing, hunting, trapping, and hiring out as guides to hunters and sportsfishermen. In and around the upper reached of the Albemarle Sound, at the mouths of the Roanoke and Chowan Rivers, one can still find people who string together seasonal work in the herring fishery, hunting, logging, and occasional farming.

Two of the earliest fisheries in North Carolina provided an organizational template for fisheries that continues, in altered form, today. The early herring fisheries on the Chowan River and the Albemarle Sound were highly capitalized fisheries in which harvesting and processing were as tightly integrated as today's menhaden fishery. At the other extreme were the casual, almost passive, shore-based whaling operations organized by groups of families from the barrier

islands, highly seasonal and sporadic, where the harvesting, processing, and marketing of the catch were accomplished by the same families that landed the whales.

Between these two extremes were the kinds of operations that the herring fishery eventually became following the Civil War, when a Union veteran returned to North Carolina and introduced the pound net: a group of commercial harvesters fishing as independents yet tied to a processing/marketing sector by means of various informal and credit relationships. Today these organizational forms can be found in the state's principal fisheries.

III. Recreational and Subsistence Fishing in North Carolina

Recreational and subsistence fishing in North Carolina derive from time-honored traditions that date back to the days that inland residents set up temporary shelters on the Outer Banks to fish for striped bass, redfish, bluefish, and other species that would keep through the year by means of smoking or salting. Alongside the great commercial herring fisheries of the 17th century, families of pioneers, slaves, and Native Americans typically dip-netted herring for salted or corned fish that would feed them during the winter months. Early photographs of tourists to Nags Head and Beaufort often show groups of anglers standing beside strings of bass or prize tuna, or steam-powered party boats returning from day trips to the Gulf Stream. For generations every year, families from the piedmont and mountains of the state flock to the piers and coastal motels during the annual runs of spot and bluefish, filling coolers with enough fish to last nearly all year. Sportfishing, charter and party boat fishing, fishing from piers, and engaging in the leisure activities that accompany fishing trips to the coast have been as important as hunting and decoy-carving among the traditions of North Carolina's coast for several generations.

Unlike anglers in most other states, however, saltwater recreational fishing behaviors in North Carolina has been difficult to track and monitor due to the lack of a license for sampling purposes. Thus the state lacks information on thousands of recreational fishermen, having little or no idea of the extent of their collective impact on the marine environment.

To address this information deficit, we conducted structured interviews with 178 recreational and other non-commercial (e.g. subsistence) fishermen located by three methods: 1) an intercept sample of 90 individuals administered questionnaires at North Carolina fishing structures, such as piers, jetties and bridges; 2) a mail-out sample of 41 individuals who were listed on DMF licensing data as possessing commercial licenses but not Endorsements to Sell; and

3) a mail-out sample of 47 individuals generated by the Coastal Conservation Association of North Carolina (formerly the Atlantic Coast Conservation Association or ACCA). The response rates to the mail-out samples were 31.5% for sample 2 and 47% for sample 3; many of the individuals on the DMF license list, however, either had no commercial license or had an Endorsement to Sell, and thus were excluded from the sample. A copy of the questionnaire is included in Appendix A. We present the frequencies and statistical analyses comparing subsamples of this population below. As noted in the Executive Summary, the idea of a saltwater fishing license receives widespread support among organized recreational fishermen (those belonging to clubs) but less support from those who do not belong to sportfishing organizations. Club membership is, in fact, an important predictive variable in terms of other fishing behaviors and attitudes as well. Frequency distributions describe the entire sample and offer some basis for the interpretation of the comparative results below.

General Findings

Demographic Considerations. The fishermen we interviewed for this portion of the study were overwhelmingly white males (95%) between the ages of 21 and 79, with the average being in their late forties (48.3 years). One quarter were between 20 and 41 years of age, one quarter between 40 and 48, one quarter between 47 and 59, and the remaining quarter over 59 years of age. Most (89%) were North Carolina residents, only 7.1% had not finished high school, and over 60% had had some training or education after high school. Slightly more than three-fourths (77%) were married at the time of the interview, with 11.% never having married and the remainder either divorced/separated (6.9%) or widowed (4%). Four out of five interviewed had some children, yet only 41.9% lived in households with more than two individuals; only 13.3% were retired. Briefly, it seems clear, the findings below apply to an older population of white males whose children have left home and who are relatively well educated.

Fishing Locations. Influenced by our sampling methodology, of course, 40.6% of the fishermen we interviewed fish most often from manmade structures, 34.3% from private boats, 19.4% from the beach or bank, and the remainder from other locations such as charter boats or a combination of the others. Fully 78.5% of those interviewed fish primarily in state waters (rivers, sounds, or less than 3 miles from shore), with only 12.8% reporting that they fish most often more than three miles from shore, in federal waters, and the vast majority (83.1%) rarely fishing in fresh

water. Clearly, then, over three-fourths of those in our sample overlap with the fishing territories of most commercial fishermen in the state.

We elicited 65 favorite specific, named fishing locations from fishermen, ranging from Nags Head in the north to points in and around Holden Beach and Shell Island in the South, thus covering most of the coast. Again, our sampling strategy favored fishermen who fished from piers, bridges, other manmade structures, and beaches; just under one in five fishermen did not have a favored fishing location. Data from this sample suggest that recreational fishers thus return again and again to the same locations to fish, establishing individual and family traditions. They share this localized strategy with commercial fishermen, who, as noted in the cultural mapping section above, tend to fish in a fairly narrow range of territories.

Fishing Effort. Anglers interviewed fish from one to 330 days per year. Average fishing effort is around 42 days/year, which would be 80% of the weekends, yet this varies widely within the sample. One third of the sample fish from 1 to 15 days per year; another third fish from 15 to 30; and another third fish more than 30 days per year. Only 17% fish more than one day per week per year. These individuals tend to be slightly older than the average age in the total sample, 53 as opposed to 48.3 years old, and to be slightly less likely to join clubs, but otherwise vary little from the remainder of the population. One quarter of the anglers interviewed fish between one and four hours when interviewed or on a typical fishing excursion, one quarter fish from five to six hours, one quarter from seven to eight hours, and one quarter more than eight hours.

Target Species. When they do fish, although slightly more than a third of the population has no target species (35.3%), the most commonly sought species include: king mackerel, flounder, trout, spot, bluefish, and Spanish mackerel, each mentioned by between 5 and 10% of those interviewed. Fishermen did list 34 species of fish and shellfish when asked if they preferred to catch specific species, however. They catch these species, of course, primarily with hook and line, which 93% report using most of the time; nevertheless, nearly a quarter (22.5%) use some form of commercial fishing gear, including crab pots, shrimp trawls, and gill nets. Nearly one third (28.7%) rely on commercial fishermen for bait to catch these species.

Disposition of the Catch. In terms of the disposition of the catch, we found that around one third eat 100% of their catch and only 3% eat none of their catch; fully two-thirds of those interviewed reported that they and their families eat the fish they catch at least one day per week,

suggesting that these fish may in fact be a cornerstone of some household diets. Around three-fourths give some of their catch away (usually about half what they catch), and under 10% sell their catch. Just over 20% release some of the fish they catch.

Fishing Traditions, Magazines, and Club Memberships. Nearly half (49.4%) of the population reported having no set annual fishing tradition, and most of those who listed fishing traditions simply stated that they fished around the same time every year. Fewer fishermen (42.9%) subscribe to any fishing magazines and even fewer of those interviewed (68.6%) belong to recreational fishing clubs. Around 10% rely on commercial fishermen to tell them about fishing locations. Of those who do belong, the most (85% of club members; 26.9% of entire sample) belong to the CCANC (formerly the ACCA). Only around 23% of the population have attended recreational fishing club meetings, and only 10.6% attend regularly. Indeed, attending meetings is rare among those interviewed, with only 28.9% attending a public hearing on commercial fishing, 19% attending a hearing on coastal development, and 14.9% attending a hearing on coastal industry. Neither was participation in fishing tournaments high, with only around one quarter of those interviewed saying they had entered one.

Vessel Ownership. Boat ownership is relatively common among those interviewed, with 58.4% reporting that they owned boats. These are usually smaller vessels, between 8 and 29 feet in length. One third of the boat-owning population possess boats shorter than 15 feet, one third possess boats between 15 and 20 feet, and one third possess boats between 20 and 30 feet.

Licensing. Of course, a central part of our study was to assess the desire for a saltwater fishing license, and many of the comparisons below seek to discover those variables that predict the propensity to accept or reject licensing in North Carolina saltwater recreational fisheries. We asked several questions related to licensing, beginning with whether or not they possessed licenses for hunting and freshwater fishing, finding that 43.7% interviewed possessed the former and 51% the latter. Did prior possession of licensing influence their attitudes toward a saltwater recreational fishing license? Our data suggest that the possession of a freshwater fishing license does positively affect one's attitude toward saltwater licensing, but that possessing a hunting license has little to no effect:

Table 2. Freshwater Fishing License Possession By Attitudes Toward a Saltwater Recreational Fishing (SRF) License

Attitude Toward SRF License	License Possession	
	No	Yes
No License	28%	20%
Yes	8%	16%
Conditional Yes	13%	15%

chi-square p=.033 (statistically significant)

Table 3. Hunting License Possession By Attitudes Toward a Saltwater Recreational Fishing (SRF) License

Attitude Toward SRF License	License Possession	
	No	Yes
No License	29%	18%
Yes	12%	13%
Conditional Yes	16%	12%

chi-square p=.362 (statistically insignificant)

These figures suggest that those with freshwater fishing licenses are slightly more amenable to the idea of a SRF license than those who do not have fishing licenses. In the total population, anglers were split about half and half over the question of a saltwater recreational fishing license, with 48.3% opposed and the remainder in favor of licensing recreational fishers. Of the 51.7% in favor of the license, however, slightly more than half favor a saltwater fishing license only under certain conditions, primarily insisting that the fees collected from such a license be used to enhance saltwater recreational fishing. Over two-thirds (69%) favor the use of fees for the enforcement of fishing regulations, 81.5% favor the use of fees for conservation measures, and 66.2% favor the use of fees for fisheries research. About one third of those interviewed favor species stamps on licenses, that would give anglers permission to fish for certain species, similar to duck stamps. When asked how much they would be willing to pay for a SRF license, one quarter said $10.00, around 29% said under $10.00, and most of the remainder (42.3%) said between $10.00 and $25.00 (n=156; 22 respondents refused to answer this question.

A Comparative Analysis of Recreational Fishers

We designed the questionnaire specifically to allow comparisons within the recreational fishing population along several grounds. Among the more important comparisons are between those who belong to fishing clubs and those who do not, since the leaders of fishing clubs often claim to represent the opinions of anglers throughout the state. Our comparisons show that this is not always the case: recreational fishing organizations represent anglers with viewpoints that are not widely shared among all recreational fishermen. Specifically, club members are more in favor of a saltwater recreational fishing license than those who do not belong to clubs, are more likely to fish from boats, and differ from independent anglers in terms of a number of attitudes they hold.

Club membership does not seem tied to fishing effort, however, as the following data show; for both groups, variation within the population is quite large and average days are not different enough to demonstrate significance:

Table 4. Club Membership By Fishing Effort

Club Membership	Days Per Year Fishing Effort		
	Minimum	Maximum	Mean
No	1	330	41.3
Yes	5	275	43.1

(not significant)

Fishing effort does vary slightly by fishing location, however, with those fishing from a boat fishing between 10 and 13 days fewer per year than those fishing from the shore. Club membership does predict, slightly, whether one does fish from a boat, manmade structure, or a beach or bank:

Table 5. Club Membership By Fishing Location

Club Membership	Fishing Location		
	Beach/Bank	Manmade Structure	Private Boat
No	14.2%	43.3%	34.2%
Yes	30.9%	14.5%	54.5%

chi-square=17.592; df=2;p=.000 (significant)

Although club members do not fish more days per year than independent anglers, club membership does predict whether one fishes from a boat or a manmade structure, which in turn influences whether or not one fishes in state waters. Nearly one-third (31.5%) of the club members fish in federal waters while only 4.2% of independent anglers fish in federal waters. Interestingly, 50% of the independents own boats, compared to 79% of the club members, yet only the few mentioned above venture far from shore in those boats.

Ironically, while club members do not seem nearly as tied to state waters and hence state regulations as independents, they are far more likely to favor the implementation of a saltwater recreational fishing license than are independents:

Table 6. Club Membership By Attitudes Toward a Saltwater Recreational Fishing License

Club Membership	Attitudes Toward License		
	No	Yes	Conditional Yes
No	60.5%	16.8%	22.7%
Yes	20.8%	41.5%	37.7%

chi-square=24.2; df=2; p=.000

Club membership affects more than attitudes toward licensing, but predicts responses to other attitudinal variables, in particular the set of agree/disagree questions that we drew from an earlier study of conflicts between recreational and commercial fishermen in North Carolina (Griffith and Johnson 1993).

Table 7. Agreement with Statement, "Regulations should apply to everyone, whether commercial or recreational fishermen," by Club Membership.

Club Membership	Number who disagree	Number who agree
No	22.13%	77.87%
Yes	7.55%	92.45%
	chi-square p=.020 (significant)	

Table 8. Agreement with Statement, "The only way some of the major species will survive in the sounds is to ban both the commercial and recreational take of these species," by Club Membership.

Club Membership	Number who disagree	Number who agree
No	46.64%	53.39%
Yes	43.4%	56.60%
	(not significant)	

Table 9. Agreement with Statement, "Any depletion in stocks is due more to pollution problems and habitat degradation than overfishing by commercial or recreational fishermen" by Club Membership.

Club Membership	Number who disagree	Number who agree
No	53.57%	46.43%
Yes	82.69%	17.31%
	chi-square p=.000 (significant)	

Table 10. Agreement with Statement, "Increasing tourism and weekend residents are putting more pressure on the fish and shellfish stocks than commercial fishermen" by Club Membership.

Club Membership	Number who disagree	Number who agree
No	78.15%	21.85%
Yes	90.38%	9.62%
	chi-square p=.048 (significant)	

Table 11. Agreement with Statement, "Even though sport fishermen are harvesting fish too, most of the regulatory burden falls on the shoulders of commercial fishermen" by Club Membership.

Club Membership	Number who disagree	Number who agree
No	38.14%	61.86%
Yes	92.45%	7.55%
	chi-square p=.000 (significant)	

Table 12. Agreement with Statement, "The commercial fisherman can't hardly fish because there are so many sportsmen" by Club Membership.

Club Membership	Number who disagree	Number who agree
No	85.95%	14.05%
Yes	24.07%	75.93%
	chi-square p=.000 (significant)	

13. Agreement with Statement, "Recreational fishermen need to help pay to keep up the fisheries," by Club Membership.

Club Membership	Number who disagree	Number who agree
No	34.75%	65.25%
Yes	13.21%	86.79%
	chi-square p=.004 (significant)	

Table 14. Agreement with Statement, "There are abuses by both recreational and commercial fishers" by Club Membership.

Club Membership	Number who disagree	Number who agree
No	14.75%	85.25%
Yes	58.49%	41.51%
	chi-square p=.000 (significant)	

Table 15. Agreement with Statement, "The problem between recreational and commercial groups is not a matter of conservation of resources, but is really more of a matter of allocation of these resources" by Club Membership.

Club Membership	Number who disagree	Number who agree
No	32.11%	67.89%
Yes	15.69%	84.31%
	chi-square p=.000 (significant)	

Table 16. Agreement with Statement, "Sportsfishermen spend significantly more dollars per fish caught than commercial fishermen and are, therefore, more economically important to many local economies," by Club Membership.

Club Membership	Number who disagree	Number who agree
No	36.97%	63.03%
Yes	52.94%	47.06%
	chi-square p=.053 (significant)	

Table 17. Agreement with Statement, "There is little hope for compromise between commercial and recreational fishing interests in this state," by Club Membership.

Club Membership	Number who disagree	Number who agree
No	47.37%	52.63%
Yes	37.50%	62.50%
	(not significant)	

These figures suggest both heartening and disturbing consequences of club membership in the state. Evidently, belonging to a fishing club makes one more responsible in terms of sharing the cost of resource management with commercial fishermen, as indicated by the attitudes toward licensing and toward the questions about everyone being regulated. Yet club membership also has a tendency to shift blame for declines in fishery stocks from pollution and habitat degradation to overfishing.

Professional Recreational Fishermen

Charter Boat Captains

Charter boat captains occupy a position between recreational and commercial fishermen and, in fact, often move between winter commercial fishing and running charters during the summer. A few we interviewed for this study come from long family traditions of fishing, both commercially and as charter boat captains, and maintain strong social links with the commercial fishing industry in the state.

Of course, nearly all of their business as charter boat operators occurs during the summer months and most of their clientele are tourists, but charter boat captains reported fishing heavily into the fall and beginning in the late spring. If we consider that the heavy tourist season lasts

from Memorial Day to Labor Day, charter boat captains extend that time period by a few months on either end. Evidently, too, some sporadic chartering occurs during the winter months as well.

We were only able to interview 15 charter boat captains, because many were either unable or unwilling to participate. Nevertheless, these share several of the same opinions and overlap with the opinions of other charter boat captains we interviewed in other research phases (cultural mapping, in-depth interviews, and focus groups). In particular, regarding a saltwater recreational fishing license, charter boat captains are almost uniformly opposed to such a license, but less on the grounds that it would cause reductions in business than they considered it yet another inconvenience to their customers. Most admitted that their customers, willing to spend hundreds of dollars to come to the state or to the coast to fish, probably wouldn't stop coming because of an extra five or ten dollars for a license, yet added comments like, "I feel like people are overtaxed already," or "It's like putting a tax on the people and another tax on the charter boat."

There was little doubt about how the fees from licensing, if imposed, should be used: nearly everyone we interviewed said that the fees should return to the fisheries. First and foremost, captains agreed that there was a need for greater enforcement, although many here refer to federal enforcement, because several we interviewed fish between 75% and 100% of their time in federal waters. Captains also mentioned that fees from licensing should be used for the development of the fisheries themselves, either through stock enhancement research or the development of artificial reefs.

Because charter boat captains operate out of tourist centers, they are becoming increasingly disturbed about coastal access and congestion problems. While competition over space in federal waters tends not to be a problem, the increase in boating and jet ski traffic in in-shore waters during the summer months presents safety hazards and inconveniences that, they believe, did not exist five to ten years ago.

Pier Owners

Similar to charter boat captains, pier owners oppose a saltwater recreational fishing license, but they were more likely to base their opposition on business considerations rather than political attitudes. Pier owners believe that their businesses would suffer with the imposition of a license, putting an additional cost and inconveniencing their customers and increasing their own burdens by forcing them to explain to long time visitors that they will have to begin purchasing

licenses. Above, of course, we noted that most anglers we interviewed through the intercept method on North Carolina piers opposed a saltwater recreational fishing license; it should come as little surprise that pier owners agree with their customers.

If licenses are imposed, however, most pier owners agreed that they would prefer a single pier license as opposed to having to license every one of their customers. Amounts mentioned for pier licenses ranged from $500 $3,000. Unanimously, pier owners we interviewed favored putting fees from licensing into enforcement first and resource enhancement programs second, with the principal object of enforcement efforts being net fishermen (especially illegal net fishermen).

Summary

It is quite clear that attitudes toward a saltwater recreational fishing license in North Carolina vary according to one's position relative to the resource. Those who belong to clubs and are more likely to fish from boats are far more likely to support licensing than those who do not belong to clubs and who fish from beaches, piers, bridges, and other shore locations. In addition, the charter boat captains and pier owners we interviewed were, without exception, opposed to a saltwater recreational fishing license for political reasons, economic reasons, or both, reflecting, in part, the attitudes of their patrons. These distinctions within the recreational fishing community in North Carolina will become important in our classification system, outlined in section VI below.

IV. North Carolina Commercial Fishing

Fewer than 2,000 families in North Carolina sell more than $10,000 worth of seafood annually, yet these full-time, professional, largely owner-operator fishermen support a commercial fishing infrastructure composed of the following:

a) a seafood processing and marketing sector of between 750 and 850 firms employing between 4,000 and 6,000 seasonal and year-round personnel (Griffith 1993, 1994, 1995; National Marine Fisheries Service 1995; US Department of Labor 1994).

b) gear manufacturers and dealers whose manufacturing traditions date back to the seventeenth century and who today provide local employment for residents of several rural counties where employment opportunities are limited.

c) service centers that provide fuel, ice, welding, boat repairs, insurance, banking, and other services to commercial fishing families.

d) crew numbering between 2,000 and 3,000.

In addition, these 2,000 families of commercial fishermen contribute directly and indirectly to several state agencies, special commissions and committees, and universities. Without them, the Division of Marine Fisheries would have far less legitimacy or justification for continued funding. They provide assistance and information to marine biologists, sociologists, anthropologists, and others interested in coastal issues, and they monitor and observe the state's marine resources on a daily basis throughout the year, reporting fish kills, illegal dumping and spills, and illegal fishing practices. And of course they provide visitors to the coast and consumers throughout the state and along the eastern seaboard with high quality, fresh seafood, seafood products, and other marine products such as fish meals and oils.

North Carolina's seafood industry may be small in terms of numbers of individuals involved in the direct harvest of fish and shellfish, but it is stitched into coastal economy and society by so many threads that it promotes social, cultural, and economic diversity to the North Carolina coast. This quality is important in today's climate of increasing economic insecurity, insecurity that derives, in large part, from low-wage, low-skill jobs in which people descend from no tradition of apprenticeship or craftsmanship and perceive no future (Reich 1993).

This quality of enhancing coastal diversity derives, as well, from the character of North Carolina commercial fisheries themselves. Within any one region, full-time, owner operator fishermen rarely specialize in any one species or gear, instead switching among gears and target species through the course of the year. There are broad north-south distinctions in the fisheries and broad east-wet distinctions as well. At a general level, those further inland tend to specialize in the late spring and summer crab and eel industries, gill-netting or working pound nets either alongside their traps, in conjunction with them (often for bait), or during other times of the year, and those closer to the Atlantic more likely to combine shrimp trawling and various kinds of ocean fishing (long-lines or sink nets, for example) with winter clamming, scalloping, or, more rarely today, oystering. Yet a number of fairly localized and seasonally constricted fisheries also exist, such as the late spring herring fishery in the Albemarle Sound and its adjacent rivers or the fall mullet fishery along the Outer Banks, and full-time commercial fishermen tend to take

advantage of these localized fisheries whenever they can. The flexibility to move among and between fisheries, both on a seasonal basis and from year to year, is a hallmark of North Carolina fishing, particularly in those regions of the state where access to in-shore and off-shore waters is possible.

Certainly one of the industry's central defining features is that it exhibits a great deal of internal variation. This variation occurs along several lines, yet our research indicates that three sources of variation are particularly important in terms of understanding different groups of fishing families' motives for fishing, strategies, target species, gears, and social problems in which they become involved:

1. regional/ecological sources of variation;
2. variation that derives from fishing families' and their associated fishing centers' proximity to metropolitan areas;
3. variation that derives from fishing families' relationships to the marketing and processing sectors.

In combination, these three factors influence fishers' primary and secondary target species, the gears they utilize (including vessels), the stock assessment and biological issues that are relevant to their lifestyles and fisheries, the principal social problems they face both on and off the water, and their survival and coping strategies, including their participation or lack of participation in the political process and their acceptance of, or resistance to, new regulatory initiatives.

Recognizing the importance of regional/ecological factors, we collected information by means of in-depth interviews and focus groups in five regions of the state. These regions correspond, roughly, to the regions noted by Johnson and Orbach in their sampling strategy:

1. Southern, consisting of that part of the state south of the Neuse River, since the Neuse has been, historically and prehistorically, an important boundary between northern and southern coastal populations (Swanton 1946; Mathis and Crow 1993). This region includes New Hanover County, which is one of the fastest growing counties in the nation. Shrimp trawling is common in this area, combined with gill-netting flounder. Some individuals we interviewed leased oyster gardens in this region, yet this is becoming more rare with increasing water quality problems in this area.

2. Carteret/Middle Eastern, consisting of the Beaufort/Morehead City metropolitan area, Bogue Banks and Sound, Core Sound, and the long peninsula and neighboring islands known, collectively, as Down East. Full time fishermen in this region exhibit some of the most diverse fishing strategies in the state. While shrimp trawling lies at the core of many operations, it tends to be one of at least three or four different fisheries, including winter scalloping and clamming, gill-netting different finfish species. This area, of course, is home to the menhaden fleet, the highly specialized, vertically integrated fishery that is quite distinct from other fisheries in the state.
3. Pamlico/ Middle Western, consisting of the peninsula and neighboring islands between the Neuse and Pamlico Rivers and the southern shore of the peninsula between the Pamlico River and the Albemarle Sound. This is the heart of the blue crab industry, although fishers will mix crabbing with gill-netting flounder and other finfish; in addition, peeler operations are not uncommon in this region.
4. Albemarle, consisting of the waters and surrounding land between the Roanoke and Alligator Rivers, including the Albemarle and Currituck Sounds. Similar to the Middle Western region, those who crab in this region are likely to set eel pots, operate pound nets for herring and other finfish, and gill-net for flounder when they can maneuver around the thickening striped bass population.
5. Eastern Dare/Outer Banks, consisting of the area from the Wanchese/Manteo/Nags Head metropolitan area to Ocracoke along the Outer Banks. Many of the fishermen of this region fish in federal waters, operating a range of nets and hook-and-line operations (long-lines), including fish and shrimp trawls. Pot or trap fisheries are less common in these waters than in other regions, and charter boating is a viable option for many commercial fishermen who move between heavy winter fishing and operating charters for summer tourists. The seasonal runs of mullet, spot, and other species fill in gaps in other fisheries in these waters.

Each of these areas varies internally in terms of the relations within the processing and marketing sectors and proximity to urban areas and, consequently, in terms of the other factors listed above (species, gear, biological issues, social problems, etc.). Because these three factors combine to define the specific dimensions of any locality's or fishing village's behavior toward the state's marine resources, North Carolina fisheries tend to be extremely compartmentalized.

Fishermen in one area frequently possess little or no knowledge about fishermen and fishing practices less than fifty miles away, despite their practicing similar fishing techniques and targeting similar species from place to place. These internal distinctions will become more clear in the following analysis.

Results of In-depth Interviews and Focus Groups

Most social scientific analyses of fishing in North Carolina focus exclusively on a narrow range of fishing behaviors and techniques without considering the location of specific fisheries in terms of regional and local social and cultural processes, including those that derive from historical traditions and policy decisions. All North Carolina fisheries are influenced by and influence such larger contexts, however, and to detach them from these larger contexts is, unfortunately, to distort reality. It is for this reason that the advanced anthropological and sociological methods combine survey administration with more in-depth interviewing and data collection techniques that enable us to interpret the data from surveys as accurately as possible.

The survey's principal strength is that it measures a representative sample of fishermen with the same yardstick; its principal weakness is that that yardstick only takes a single reading at a single time, and that it runs the risk of coaching respondents toward their responses. Surveys thus always need to be supplemented with alternative data collection techniques, including in-depth interviews, transect walks or rides (walks or rides through areas of intense fishing activity with local fishermen to explain the importance of different behaviors), mapping, conducting and analyzing focus groups, and relying on secondary source data from earlier scientific reports, newspaper articles, and data collected on other fisheries in other areas of the country.

In particular, the most sophisticated social scientific analysis utilizes a method known as traingulation, where researchers interview individuals representing different political and economic positions, social class backgrounds, and cultural traditions about the same or similar sets of issues—such as licensing and other regulations—and then compare the responses for areas of agreement and disagreement. Throughout our analysis, we triangulate responses for accurate readings on issues about which respondents are likely to be biased because of economic interests or political affiliations, paying close attention to those areas where we find broad agreement, and examining more critically those areas where less consensus.

We conducted in-depth interviews with commercial fishermen, including some charter boat fishermen, in each of the regions of the state noted above. These respondents were selected as a subsample from the survey conducted by Johnson and Orbach. Following these interviews, we held focus groups in four of the five regions, drawing on fishermen representing specific regions and fishing traditions, as follows:

1. *Beaufort (Pivers Island).* Participants were full-time, owner-operator commercial fishermen, primarily trawlers and crabbers who also fish with nets sporadically through the year (e.g. during mullet season), based in Carteret County and fishing in the Core and Pamlico Sounds as well as in federal waters of the Atlantic Ocean.
2. *Oriental.* Participants were full-time, owner-operator commercial crabbers operating in the waters surrounding Pamlico County, including the Neuse and Pamlico Rivers and the several creeks and bays that cut into the Craven-Pamlico-Beaufort Peninsula.
3. *Edenton.* Participants were full-time commercial gill and pound net fishermen, crabbers, and eel fishermen who fished in the Albemarle Sound and some of the large tributaries (e.g. Chowan and Roanoke Rivers) known for anadromous species such as herring.
4. *Wilmington.* Participants were varied, representing the shrimp trawling sector and the charter boat sector, fishing in the waters off Wilmington and Lockwood Folly Inlet.

While we also arranged a focus group in Hatteras Village, only one fishing couple we invited came. Part of the problem with arranging a focus group in this region, as opposed to the others, was that the heavy fishing season occurs during the winter and early spring months and thus conflicted with the research schedule demanded by Committee deadlines. We were, however, able to conduct in-depth interviews with fishermen from this area, however, and we rely on these in our discussion of the Outer Banks/Northeastern area.

In all cases, we encouraged married fishermen to bring their wives; about half of those who attended did so. We invited between five and seven couples, with group sizes ranging from ten to thirteen individuals. These group discussions were focused in the sense that we encouraged participants to direct their attention to the work of the Moratorium Steering Committee, particularly its licensing proposals, and respond to our ideas, from the in-depth interviews, regarding important criteria for defining and classifying fishermen. Specifically, we discussed those attributes of commercial fishing that differentiate different kinds or classes of fishermen

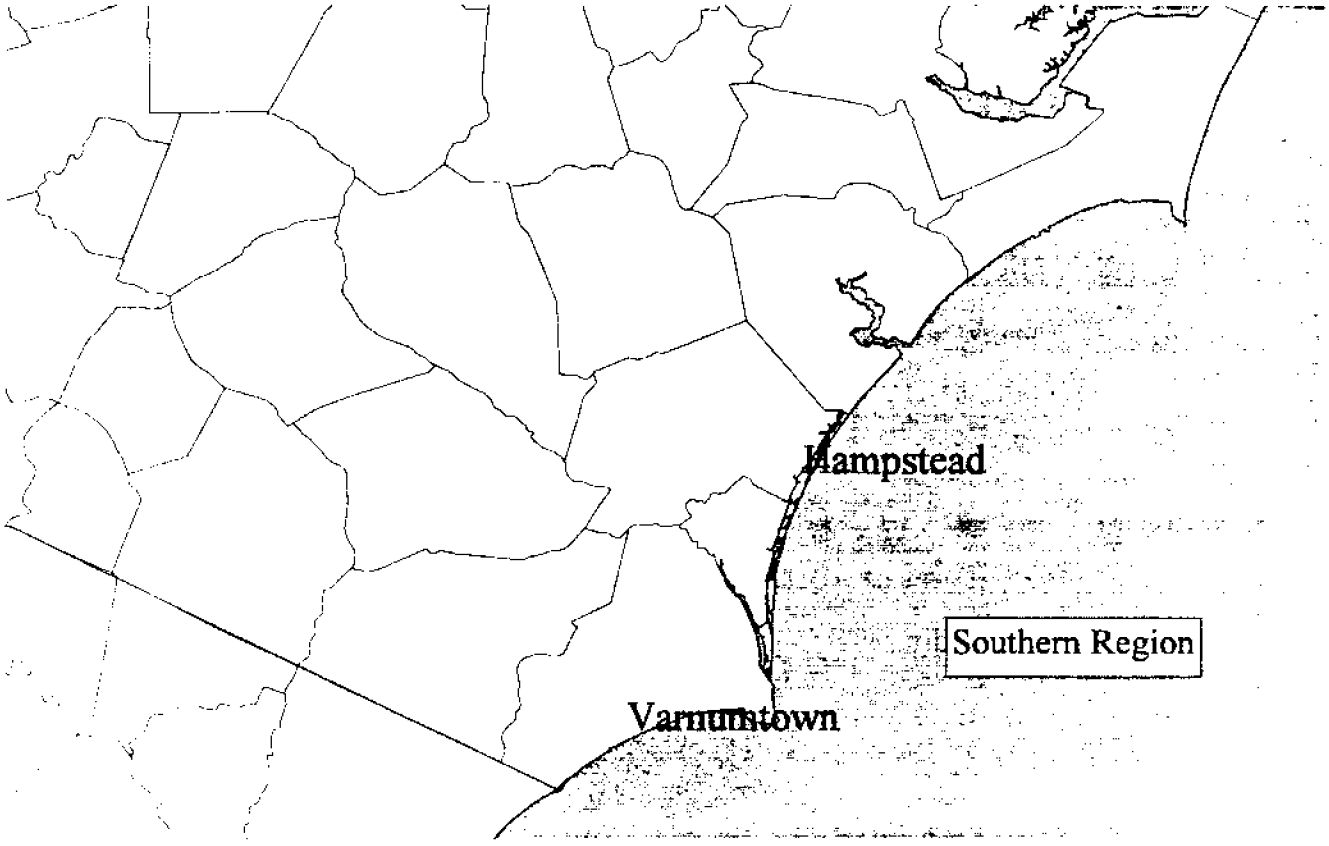
from one another (e.g. part-time commercial fishermen from full time). At the same time, to estimate impacts of new regulations, we used the opportunities provided by the focus groups to capture the range of perceptions toward new regulations.

The analysis that follows draws on both the in-depth interviews and the texts of the focus groups. Data derived from open-ended interviewing of this nature are often dismissed as "anecdotal," reducing their authority, yet we point out that, as shown in Appendix A, these interviews followed a standard protocol; in addition, we took care to select informants from every region of the state and representing different fisheries and different levels and kinds of involvement in fisheries. And most importantly, to they extend that they resemble anecdotes, anecdotes are, of course, important as actual experiences of individuals deeply involved in North Carolina fisheries. This phase of research generated between 85 and 100 hours of taped conversations with commercial fishermen and charter boat captains. We cannot, however, present all of the issues raised in these conversations, nor share the full texts of the interviews with the Committee (for reasons of confidentiality). For the sake of parsimony, then, we present the results of this extensive and extremely time-consuming phase of research in summary form, including exemplary passages in the analysis. While we cannot help but address the technical dimensions of fishermen and fishing styles in each region (i.e., vessels, gears, species, and seasons), we focus primarily on the cultural and sociological dimensions, since the technical dimensions are, for the most part, being reported by Johnson and Orbach. Much of the discussion that follows focuses on the problems facing fishermen, primarily because early in our research we discovered that fishermen tend to see themselves and their fishing activities as becoming ever more deeply involved in social problems, especially those of a political and economic nature; in the most severe cases, fishermen believe their way of life is becoming increasingly criminalized. As such, we need to consider the social problems facing fishermen in North Carolina as defining attributes as much as the vessels they sail, the species they target, and the gears they use.

We found several common themes across the state, which will emerge in the classification work that follows, yet fishermen and fishing families in each region were faced with slightly different problems and, because they specialized in different issues, possessed expertise in different areas. These areas of expertise focus our discussions.

1. Southern Region.

- Primary Gears: Shrimp Trawl, Gill Net
- Primary Fisheries: Shrimp, Flounder, Mullet, Spot, Oysters & Clams (historically)
- Principal ecological/stock issues: damaged substrates from dredging, oyster/clam stocks collapsed, nutrient loading from hog industry, chemicals from golf courses and new industries.
- Principal social problems: lack of enforcement; summer crowding due to recreational development (particularly jet skis and recreational boats); recreational/commercial fishing conflicts.



- Earning and Coping Strategies: mixing of fishing and nonfishing employment; migrating to South Carolina to shrimp.
- Relations with marketing/processing sector: independent, personal loyalty.
- Most desired regulations: protection of juvenile shrimp (area closures, count limits) protection/reseeding of oyster gardens.
- Most disruptive regulations: season/time closures on shrimp, with opening days leading to crowding.

At the heart of this region, of course, is the Wilmington-Wrightsville Beach metropolitan area. The recent growth and diversification of this area—including several new manufacturing firms and a budding film industry—influence trends in commercial development and other attributes of the economy, particularly the increasing growth in tourism and seasonal residents and the accompanying high land and housing values. Much of the full-time, owner-operator commercial fishing activity, and the associated seafood dealers and processing houses, is focused south of this metropolis, between Calabash, near the South Carolina border, and Southport, once home to menhaden boats. Lockwood Folly River, the waters south of Shallote, and the Intra-Coastal Waterway are home to several fish houses that concentrate fleets of shrimp trawlers and smaller vessels for gill-netting finfish, but every tourist season these fishing centers are overwhelmed by the growth of tourist traffic along barrier islands and towns such as Holden Beach, Long Beach, and Ocean Isle Beach. A few individuals we interviewed leased oyster gardens from the state, others were shrimpers, often traveling back and forth between North and South Carolina waters, and others were charter boat fishermen. A few were part-time fishermen who, over the course of several years, moved between full-time fishing a full-time employment on shore.

Recent growth trends in New Hanover County drive many of the fishing issues and practices in the Southern region. Fishermen here are particularly well-qualified to comment on water quality issues—particularly how they have affected oyster and clam beds—and to compare fishing practices and regulations in North and South Carolina, since many shrimpers move between small towns like Varnumtown, in Brunswick County, and South Carolina ports. In addition, fishermen in the area close to Wilmington, similar to fishermen near growing urban areas elsewhere along the coast, are particularly sensitive to the importance of one's personal fishing history in questions surrounding eligibility for commercial fishing licenses and endorsements to sell. Fishermen here, particularly those involved in the oyster industry, have moved between fishing and nonfishing sources of income most of their lives, sometimes staying out of fishing for several months or years because of difficulties with the resource, yet always maintaining an interest and an investment of time, income, and identity in returning to the fishing way of life. A recent study by Garrity-Blake (1996) concluded that many of those who seem to have left fishing for shore-based employment in fact remain attached to fishing, seeing the inclusion of shore

employment in their annual rounds as an extension of the practice of moving among different fisheries through the course of a year. Many of Garrity-Blake's informants were from yet another coastal metropolitan area (Morehead City/Beaufort), and it has been those interviewed in more urbanized areas that are more likely to engage in this long-term fishing/nonfishing strategy. Those we interviewed in the Southern region thus believe that issuing licenses or limiting entry based on an individual's past history must reach back more than a few seasons or years, averaging fishing efforts over five- to seven-year time periods, because levels of effort may fluctuate widely based on problems with the resource (particularly oysters and other shellfish stocks), exceptional employment opportunities associated with population growth (generally in construction), or other factors. According to one fisherman:

You have times in fishing when it'll get down to – like I'm just a small-boat fisherman with an outboard motor. I've been doing it since 1953 with the exception of six years – one time 17 years steady, other times I found it was profitable to go back and forth between dredges or fish independent fishing-wise. But when fishing got bad and you had four children and a house payment, you had to take a job. The guy that lived out of his car, or lived with a girlfriend in a trailer, he could hack right in there fishing. So I have a problem <u>with</u> that. In other words, the man that goes out and hustle a little bit and supports a family, he will be penalized by a dollar amount he 's allowed to make. Because he ceases in the fishery because there just isn't that much money in his location to make it with a small boat. And with the uncertainties of the licensing, I wouldn't put money in a big boat today if I didn't own one anyhow.

The specific contours of growth in this region influence the kinds of water quality issues fishermen discuss as threats to their ways of life. The varied economic base of the southern region of the state is reflected in the variety of sources of pollution, which include the beach stabilization/dredging programs and golf courses (landscaping chemicals) associated with recreational development, industrial sources associated with new and old industry in the region, and the most widely discussed agricultural source today: the growing hog industry. Sampson and Duplin Counties, within the Southern region's watershed, are two the top hog producing counties in the state and in the nation, and their waste disposal methods are a constant concern among commercial fishermen in this region. Three quotes about water quality exemplify these feelings:

Yes, the commercial fishing industry is very, very concerned about water quality. It seems they are the only ones who were, to start with, due to the fact they were going fishing, they were catching fish, crabs that have had sores on them, lesions on them. They were the first ones noticing this, but someone that makes nothing a year comes up and makes a complaint, DEHNR will not listen to you.

They constantly dredge – 12 months out of the year on the Cape Fear bar. The new proposal for Sunny Point in the billions of cubic yards they're gonna carry there. Not millions, but billions of cubic yards, because they're gonna do a complete new plan at Sunny Point, and they're gonna dump it in the ocean. Can't possibly make sense.

A sink netter will see this, off of Wrightsville Beach, 30 years ago, a mile and a half off the beach, you could not put a sink net, unless you really knew what you were doing. You were gonna tear it up on rocks. They started renourishing the beach. People don't think that sand goes somewhere; you can set a net anywhere you want to off Wrightsville Beach now and you're not gonna lose it. There are just one of two rocks out there you get hung on, but that sand has filled in that natural habitat.

Interviews with representatives of the recreational fishing industry in this region, however, revealed support for beach enhancement programs, failing to see it as a cause of resource decline. Commercial fishermen viewed dredging programs as particularly threatening to substrates, seeing definite changes in the structure of the bottom since beginning these programs.

Discussions of these problems nearly inevitably led to the difficulty fishermen have in organizing an effective resistance to the continued growth of the hog and other industries of the Southern region, most of which are represented by lobbyists and backed by large and well-financed industries. Competition between commercial fishing organizations and these better-financed groups is perceived as highly uneven, biased toward more well-organized industries and those with lobbying capability.

Similarly, fishermen in this region viewed DMF enforcement as uneven and generally inadequate, sharing this opinion with commercial fishermen in most other regions of the state and with pier owners and other representatives of the recreational fishing industry as well. The principal targets of increased enforcement, they believe, should be illegal shrimpers (those who catch smaller shrimp by dragging nursery areas) and those individuals who have few or no sailing skills and hence hinder easy navigation with jet skis and recreational vessels. At the same time, fishers we interviewed around Wilmington were, like fishermen everywhere, particularly concerned about unattended gear and the lack of attention to unattended gear by enforcement personnel.

Regulations regarding shrimping, of course, are at the top of concerns among fishermen in this region. Specifically, many expressed desires to regulate and monitor in-shore shrimping more

closely, to assure that juvenile shrimp have a chance to grow large enough to make it to the off-shore shrimping grounds.

The lists and maps accompanying each of these regional discussions summarize the principal fishing practices and concerns of fishermen in each region.

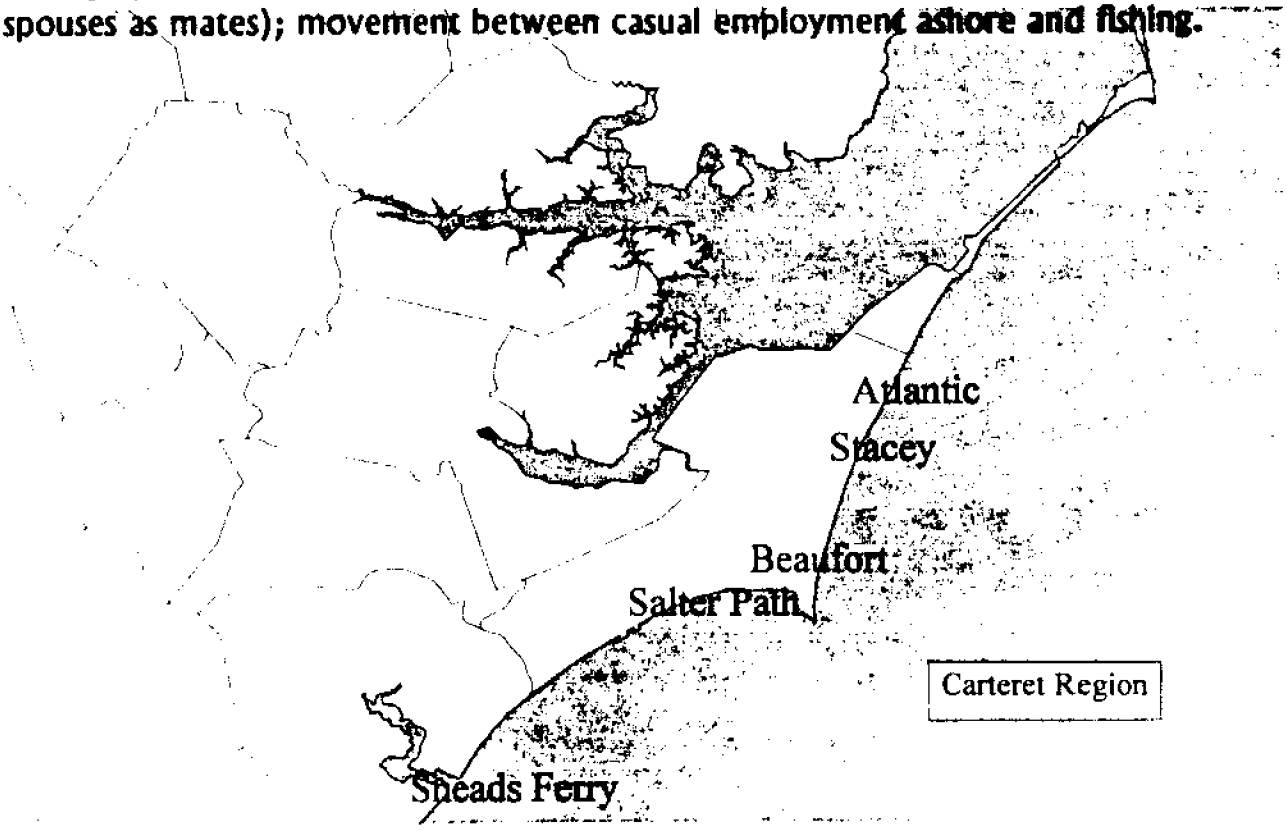
2. Carteret (Middle Eastern) Region.

Individuals interviewed in this region—including commercial fishermen, their wives, and charter boat captains—returned again and again to subjects that derived from the character of economic development in the region. In particular, the availability of jobs at Cherry Point and other areas throughout Morehead City and Beaufort, combined with the growth in real estate development, tended to orient our respondents' conversations. These trends in economic development have created uneasy relations between commercial fishing families who depend on fishing for most or all of their household income and individuals who mix full-time jobs with relatively intensive fishing with commercial gear.

At the same time, ambivalent relations exist between the recreational and commercial fishermen in this region. On the one hand, the growth in real estate development, tourism, and interest in recreational fishing in the area has had some positive results for commercial fishing families. The opening of docking facilities to accommodate increased recreational boating traffic has created opportunities for commercial fishing families to seek alternatives to tying up at seafood dealers' docks, allowing more independence from dealers and thereby increasing their marketing opportunities. The increased enthusiasm for recreational fishermen has enabled some commercial fishermen to engage in charter boat operations, but we need to be careful about viewing this as a viable option for all commercial fishing families, since many commercial fishermen resent the growth of recreational fishing traffic. Increased tourist traffic has, however, increased demand for fresh, locally caught seafood and increased the ability of fishing families to enter the marketing sector as licensed fish dealers.

Unfortunately, the increased recreational boating and fishing traffic has caused some crowding on waters during the summer months. Further, commercial fishermen in this region report that recreational fishing interests have initiated several legislative initiatives designed to allocate fish stocks between recreational and commercial fishing groups, to restrict the use of certain gears, and restrict access to marine resources by means such as area closures, season

- Primary Gears: Shrimp Trawl, Gill Net, Scallop and Clam Dredge, Crab Pots
- Primary Fisheries: Shrimp, Flounder, Scallops, Spot, Blue Crab, Clams
- Principal ecological/stock issues: pollution forcing fish into more crowded areas; nutrient loading coming into Core Sound from the Neuse River; military pollution (lead); brown and red tides; pfiesteria.
- Principal social problems: recreational/commercial fishing conflicts; conflicts between large and small operators; uneven enforcement; real estate development.
- Earning and Coping Strategies: highly flexible, multiple-gear and -target species fishing operations; politically and economically active spouses (including use of spouses as mates); movement between casual employment ashore and fishing.



- Relations with marketing/processing sector: independent, with some past problems concerning perceived price-fixing and control over coastal access points.
- Most desired regulations: ETS based on > 50% of income from commercial fishing, based on fishing income over past five to seven years; limiting part-time fishermen who are not retired or below the poverty line.
- Most disruptive regulations: Core Sound and weekend shrimp trawling closures; net ban.

closures, and time limits on fishing. They fear, in particular, a net ban based on the Florida model of putting the issue before the general public for a vote.

Commercial fishing families in this region, therefore, worry that new regulations will further restrict their ability to adapt to ecological and economic conditions. A restriction of their flexibility would be especially onerous under current conditions, with high levels of various pollutants in the estuary crowding fish into smaller and smaller areas. They base these fears not on idle speculation but on past experience. The closure of the Pamlico Sound to Friday night shrimping, for example, was particularly devastating to many of Down East fishing families living between Beaufort and Cedar Island. An comment made during the focus group in Beaufort illustrates the complex effects a closure of this nature is likely to have:

You know what they done to us two years ago? They said – I got a little boat, 29-foot, and I work in Core Sound. Well, there's times it blows 30, 35, or 40 miles an hour – I don't go out there. I'm by myself, 54 years old and clumsy. So I said, "Well, I'll stay to the dock." And then used to when Friday night come, hell, I've been laying home resting. I said, "Well, I'll go Friday night and make up." They made a rule that said you can't go shrimping on Friday night. Well, why don't they let everybody that works for the government take off Fridays? Just everybody that works for the government take off Fridays and not get paid, and I'll be satisfied. As long as you can put it across the board where it's fair. I mean, that's like telling a farmer he can't plant cabbage on Thursdays.

Most obviously, of course, the closure led to a loss of income, but the impact was somewhat more complicated in that it forced fishermen to become more regimented in their fishing behaviors. Reducing flexibility like this will have several consequences, not all of which are readily observable. In New England, after the imposition of layover provisions, where fishermen were forced to stay at the dock one day for every two days at sea, some fishermen remained at sea during unsafe weather because they could not afford to lose the days by coming into port. Obviously, the fishermen just quoted make it clear that safety considerations enter into their decision to fish or not to fish and require the flexibility that allows them to remain on shore during rough weather conditions. Income and safety issues aside, the perceptual impacts of regulations such as this are just as devastating as the material impacts: the crisis of legitimacy we find among commercial fishermen in the state today is a consequence of regulations exactly like these, which fishermen interpret as having no basis in biology or for the health of the resource.

In summary, three primary themes emerged from this area: 1) that licensing proposals and other new regulations should address the problem of fishermen who mix full-time and high-paid (e.g. $40,000/year or more) work with part-time yet often intensive commercial fishing; 2) that closures that limit fishing the same day every week, such as closing the sounds to trawling on Fridays, do not allow fishermen the flexibility to respond to changing weather patterns and have unanticipated costs for full-time commercial fishermen's incomes; and 3) that crowding of fishermen and gears in the Core Sound and other waters close to the open ocean has occurred because pollution has confined populations of fish to smaller and smaller areas.

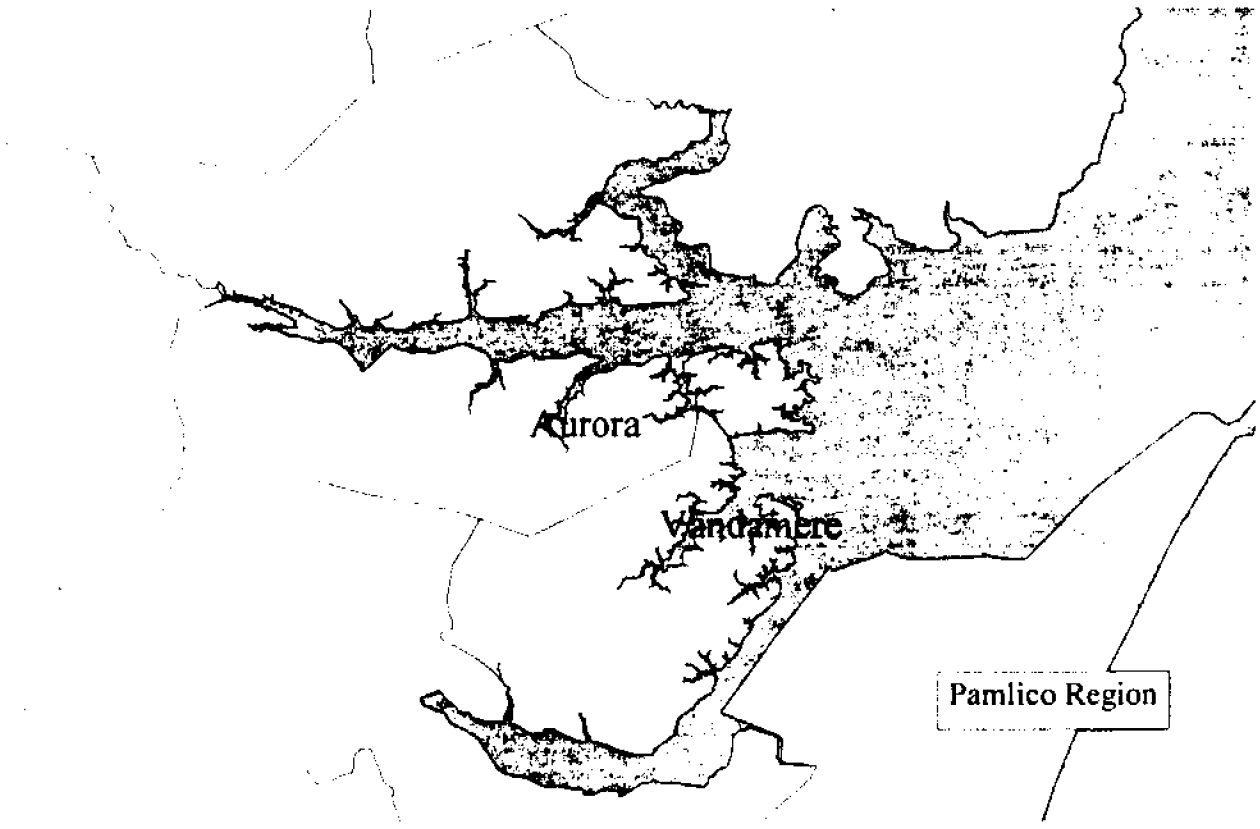
3. Pamlico Region.

Fishermen in this region are less flexible than fishermen in other regions in terms of their capability or history of moving among a number of fisheries, gears, and species through the year. Crabbing is the mainstay of this region's fishery, of course, with some supplementary netting activity both for baiting crab pots and for supplemental fish such as flounder. However, unlike other regions, fishing alternatives to crabbing are less important in the total range of fishing families' household income. As such, the most pressing problems full-time fishers in this region face are those that stem from the crowding of traps from two sources: dealers and part-time crabbers. Crowding occurs, in particular, close to shore, especially when crabbing is banned after a certain date due to navigational problems.

We conducted our most extensive interviews with crabbers in the central portion of the state, finding their comments most illuminating regarding the proposals on limiting traps. Many proposals, here and in other states, are based on an experimental reduction system that limits traps slowly. Fishermen interviewed in the central portion of North Carolina's estuarine system, principally in Pamlico County, agree with gradual reduction proposals yet understand, with somewhat more sophistication than most observers, the social contexts in which reductions take place.

Two related pressing problems in this region are the growth in the crabber and crab pot populations and the competition between the processing and harvesting sectors. Confusing the crowding issues in the Pamlico Regions are two related developments in the processing and marketing sector: a) development of the basket and peeler markets, involving more independence from processors; b) the growth of crab processing with the temporary foreign worker program.

- Primary Gears: Crab Pots, Gill Nets, Pound Nets
- Primary Fisheries: Blue Crab (including peeler operations), Flounder.
- Principal ecological/stock issues: taking and keeping of sooks (female crabs) before they lay eggs inside the estuary, often in the Core Sound; oxygen deficient water("dead water"); nutrient loading of Neuse and Pamlico Rivers; pfiesteria.
- Principal social problems: crowding of pots; part-time crabbers; conflicts between processors and owner-operators around the issue of processor-organized fleets.
- Earning and Coping Strategies: specialized, intensive crabbing; peeler operations.



- Relations with marketing/processing sector: recently developed basket market has caused some hostilities to emerge between crabbers and long-time dealers/ processors; some dependence based on dock space and credit.
- Most desired regulations: crab pot limits based on historical participation in the fishery; limits on part-time crabbing; stricter regulations on mining, forestry, and agriculture.
- Most disruptive regulations: crab pot tagging system; area closures that force crabbers closer together; net ban

The development of alternative markets for crab constricted supplies of crabs to the processing plants at a time that the plants were either expanding or attempting to maintain production levels due, primarily, to the arrival of Mexican workers. The presence of Mexican workers allowed crab processors to increase their production as their labor supplies, formerly sporadic and unpredictable, stabilized (Griffith 1995, 1994, 1993). The program that allows processors access to foreign workers encourages increased production for at least two reasons: the workers themselves complain about being without work and the costs associated with the program, primarily the workers' transportation and housing, are recovered from the workers' wages through the season. In addition, of course, the presence of a ready, willing and highly motivated labor force on the plant premises is itself an incentive to produce as much crab meat as possible.

Increased competition for crabs from the basket and peeler markets, both organized to ship live crabs out of state, have driven the process of crab processors to move into the harvesting sector. This occurs in two ways: with some processors organizing their own fleets and others attempting to regain more of their previous controls over the market, usually by creating tighter linkages with full- and part-time crabbers by providing them with dock space, credit, supplies, or other facilities or services. This process underlies the recent disputes over the presence of Mexican fishermen working for wages (as opposed to shares) on vessels operating out of Pamlico County and the disputes surrounding the growth of a Vietnamese fleet in the Albemarle Sound. These developments either originated in or were encouraged by the processing/dealer sector, in part in response to the growing independence of native North Carolina crabbers from the dealers and processors. Members of our focus group in Oriental commented on this as follows:

Bringing these [foreign] pickers in here has put a lot of pressure on the crabbing too.

It has. It's made a bigger demand.

That's it. It causes the dealers to put more people in the business. Puts more pressure on it all the around. But I'm not really against that – not the fact that they're up here a-working, picking crab, because it's got to be a job to get here.

I know until they started bringing <u>them</u> in, if there was right many crabs around or something, you wouldn't go six days a week.

Hell, I can remember when three days a week was all we could crab, in the middle of Summer.

Because of the heated nature of these disputes, the question of licensing individuals vs. licensing vessels or firms is especially relevant to fishermen in this region and in the Albemarle. In addition, because many of the part-time crabbers continue to sell their crabs to the processing houses, restrictions on part-time crabbing—generally favored by most full-time crabbers—would be met with resistance by the processing sector.

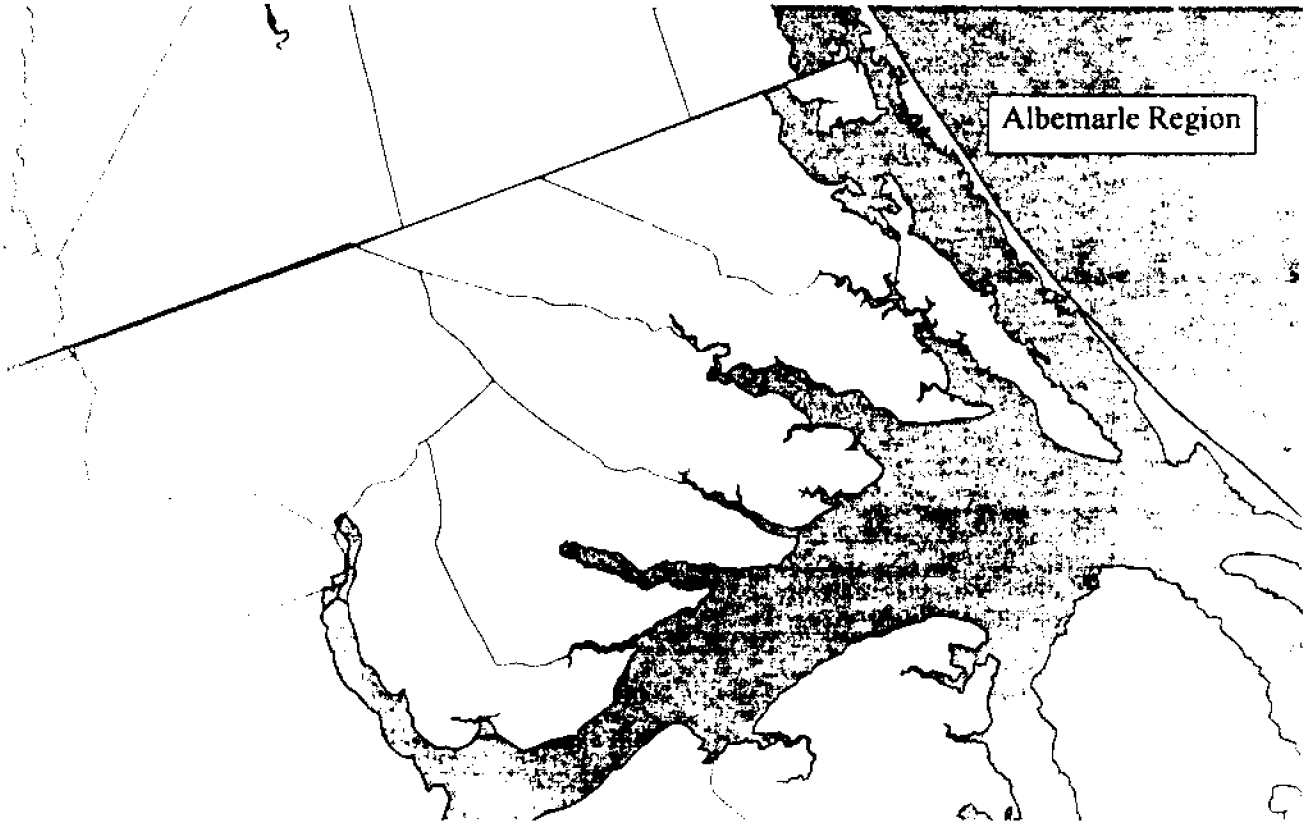
The discussion should make it clear that relations between fishing families and seafood dealer/processor families are central to the specific fishing behaviors we find in this region and in the Albemarle. Whether or not fishermen in this region are intimately tied to a processor or seafood dealer influences marketing most obviously, but also influences where they tie up their vessels and their levels of fishing effort.

In the context just described, implementing trap limits into the crabbing industry may either cause current tensions to increase or may stabilize the industry. Almost uniformly, full-time, owner-operator crabbers we interviewed favored restricting numbers of traps (but allowing some flexibility for trap loss), restricting the practice of processor organizing fleets of crabbers, and cutting part-time crabbers much more severely than full-time crabbers. Of course, these proposals are likely to be met with opposition by processors. Without limited entry guidelines, these proposals will encourage, eventually, a return to debt relations between fishermen and dealers as dealers finance fishing excursions of individually licensed crabbers on the conditions that the crabbers sell to them. Limiting the number of crab pots individuals are able to have, without limiting the number of crabbers, will likely solve current crowding problems in the short term only. Over time, the organizational composition of the industry may change from one of direct vertical integration to one of subcontractual relations between processors and crabbers, but the consequence in terms of absolute numbers of traps in the estuary are likely to be the same.

4. Albemarle Region.

We could almost summarize the difficulties facing commercial fishermen in this region with two words: striped bass. Quite simply, fishermen along the northern and southern shores of the Albemarle, whether herring fishermen, flounder fishermen, crabbers or eel potters, uniformly complain that the striped bass population has become so large as to be a nuisance. They view striped bass not only as a nuisance but as a threat to the other fisheries they are engaged in,

- Primary Gears: Gill Nets, Pound Nets, Crab Pots, Eel Pots.
- Primary Fisheries: Flounder, Herring, Blue Crab, Eels.
- Principal ecological/stock issues: overpopulation of striped bass; low oxygen ("dead water"); importance of Albemarle as a nursery area; paper mill discharges.
- Principal social problems: crowding; part-time fishing; processors organizing fleets; perceived lack of effective communication with DMF or other state regulators; misunderstandings of fishery by recreational interests; theft/destruction of gear.
- Earning and Coping Strategies: intensive, seasonally pronounced fishing; mix of fishing and farming;hunting and trapping.



- Relations with marketing/processing sector: independent, with some problems based on processors organizing or encouraging large fleets of crabbers.
- Most desired regulations: continue moratorium on licenses; net number, length & mesh size limits with assurances that they can sell what they catch; license owner-operator; limit part-time fishermen who are not retired or below the poverty line.
- Most disruptive regulations: restrictions on striped bass; net ban; early herring season closures and low quotas.

fearing that they are losing precious biodiversity and that, in particular, striped bass have been feeding on small blue crabs, damaging that population. During our focus group in Edenton, two fishermen commented:

It's crazier right now than I've ever seen, and I've been around fishing all my life, just like most of you. But right now you can set 1,000 yards of net, you can't bring but 300 crabpots in. So you pull out a thousand yards of nets now, you get halfway down one and you've got five rock. You look at them and put them in the boat, and you pull a little farther and there's one bigger. So you take one of them and you flip him out and lay another one down there. You're killing rock all the way down there. It would even be more – to me – it would even be more valuable if they would cut your limit of nets and let you sell anything you caught.

Nowadays, I'm a man of medium means, and I could run a stand of nets across that Sound five times. Line filament and all is cheap. But they'll tell you that you can't sell but five if you can set 1,000 yards. You're killing rock, killing rock, killing rock. And that's what the whole business is about is killing the rock. And they've got the worst law in place for restoring rock that they could have.

Related to the problems with the rock population are problems regarding the lack of communication between the DMF and fishermen in this region. It is in the context of the overabundance of striped bass that the fishermen in this region complain that the DMF personnel aren't listening to the ways that regulations can threaten the state's fishery resources. Similar problems have emerged over the question of herring season closures. Herring fishermen in this region have banded together to impose a net reduction scheme on all the pound net herring fishermen in the Albemarle and the rivers that feed the sound, proposing to reduce the number of nets in these waters by half as long as the state allows them to continue taking herring through April and into May, beyond the current 300,000 pound quota. They have been monitoring the herring resource for several years and they claim that cyclical population fluctuations are common, yet the DMF biologists, according to fishermen, based the current quota on the 1994 and 1995 seasons, which were particularly stressed years. In addition, herring fishermen claim that the DMF biologists have refused to visit their nets to witness the current abundance of the herring stocks. Again, this is a case of fishermen regarding themselves as close observers of the resource and understanding the role of their home estuary in the health of fisheries up and down the eastern seaboard.

Indeed, striped bass seem to be a kind of lynch pin species in the entire political and economic system. On the one hand, they represent the Albemarle's role in the Atlantic States ecosystem—as a major nursery area for the fish—and they represent the politics of fishing, because of the value of striped bass as a sportfish. At the same time, rock threaten their herring, shad, and blue crab populations and hence their traditionally most important fisheries.

Fishermen in this region of the state resemble fishermen in the Pamlico region in some regards and fishermen in the Eastern Dare region in others, and the Southern Region in still others. Their similarity with the Pamlico region derives from the fact that they are involved in uneasy relations with processing houses and dealers regarding organized fleets that land hard crabs and other fish at specific processors/dealers' facilities. Fishermen here, as opposed to pointing to Mexican immigrant fishermen concerning this problem, pointed to Vietnamese fishermen whom they believed were either financed or heavily encouraged by specific processors and dealers to fish for them. They also believed that these Vietnamese fishermen were the recipients of several forms of government assistance, including low-interest loans for fishing vessels.

One of the common complaints of crabbers, in this and other regions, was crowding, but crowding occurs unevenly in time and space across the estuary, becoming worse or better depending on environmental conditions, areas closures, and the entry of more fishermen in response to declining catches or regulatory developments in other fisheries. What occurs in crabbing during times of "dead water" in the Albemarle can be viewed as an example of what might occur if the licensing system were designed to confine fishermen to specific fisheries. Under dead water conditions, or conditions of low oxygen, fishermen move pots that were formerly spread across several depths and territories into the shallows, creating space problems and associated problems of some people fishing other, neighboring pots, deliberate or accidental destruction or theft of neighboring gear, and all the conflicts associated with these developments. Perhaps most importantly, it leads to increases in fishing effort. To keep up with those fishing close to them, they increase their numbers of traps as well as the amount of time they spend crabbing.

Like fishermen in the Eastern Dare region, as discussed below, fishermen here expressed deep concern about the relationships between North Carolina fisheries and those that are

regulated, in part, by the federal government. Weakfish, striped bass, some species of flounder, and herring were all mentioned in current jurisdictional difficulties between federal and state agencies and, more importantly, in proposals to establish federal quotas on these species. Quotas have the effect of encouraging intense fishing activity, because fishermen want to fish on stocks as heavily as they can until the quota has been met. This causes crowding and safety problems, concentrating fishing effort in time and space regardless of weather conditions or other fishing vessels. In addition, fishermen who can intercept the fish earlier in the season thus have more of an advantage to get a larger share of the quota than fishermen with the capability of intercepting the fish later in the season. For certain species, this means that the fishermen further north along the eastern seaboard are better situated to catch the entire quota than fishermen in the southern range. Indeed, statistics compiled by the National Marine Fisheries Service have shown that some of the northern states caught more than their allotted quotas, in part because of the lag time between catching and counting the fish.

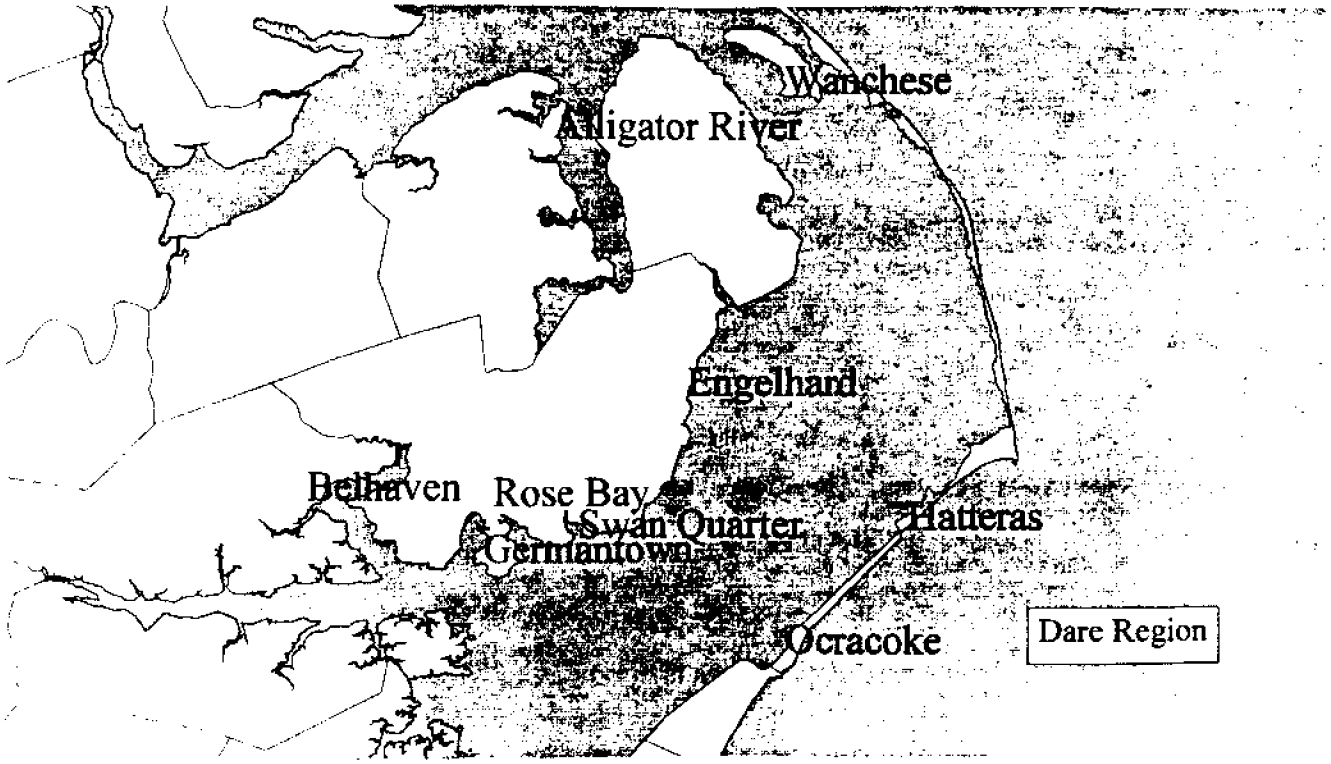
Fishermen in this region were similar to Southern Region fishermen in the sense that they saw it as common to stay out of fishing for many months or years at a time without losing one's identity as a fisherman, with some moving between fishing and farming. Part of this is related to the high seasonality of some species in the Albemarle, such as herring and striped bass.

5. Eastern Dare Region

In part because fishermen in this region depend nearly as much on fishing in federal waters as fishing in state waters, those we interviewed in this region seemed less disturbed by state regulations than fishermen in other regions. At the same time, Eastern Dare/ Outer Banks fishermen were less concerned (although not entirely unconcerned) about water quality issues than those fishermen in the other four regions. They expressed some concern over the navigational difficulties surrounding Oregon Inlet, but were far less inclined to bring up the issues of hog waste, mining, or forestry than other fishermen we interviewed.

This is not to say they have no problems. Oysters have gone due to pollution, and fishermen living in the northern and western sections of this region are suffering from similar problems as fishermen in the Albemarle: the overabundance of rock and their collective impact on other valued species, particularly blue crab.

- Primary Gears: Sink Net, Pound Net, Trawls, Crab Pots
- Primary Fisheries: Flounder and other groundfish, Shrimp, Blue Crab
- Principal ecological/stock issues: overpopulation of striped bass; collapse of oyster stocks; weakfish and flounder quotas.
- Principal social problems: slip space;conflicts with recreational/tourist interests & real estate development; problems with federal government (NPS).



- Earning and Coping Strategies: highly flexible, multiple-gear and -target species fishing operations; some charter boat fishing.
- Relations with marketing/processing sector: independent, personal loyalty.
- Most desired regulations: increased mesh sizes.
- Most disruptive regulations: net bans.

Some fishermen we interviewed cited a decrease in wintertime fishing opportunities—related, in part, to the decline in oyster stocks—saying that this has led to increases in summertime fisheries, particularly crabbing in inside waters. As fishermen come into the Pamlico and Currituck Sounds, they encounter more and more of the crowding problems associated with the trap fisheries of the Albemarle and the Pamlico regions. In particular, some of the fishermen who made this transition began resenting fishermen who relied on farming for most of their income, in Hyde and Dare Counties, yet who also engaged in extensive part-time farming.

Two factors influence the problems of fishermen in this region: that they switch between federal and state waters and hence depend on several gears and species through the year, and that they rely heavily on nets. The former predisposes fishermen in this region to object to some of the federal quota systems in the same way as they do in the Albemarle region and to view competition from fishermen from other states as problematic; the latter makes them more sensitive to those regulations affecting nets, particularly Florida's net ban (which has caused an increase in Florida net fishermen fishing in North Carolina waters or the federal waters near North Carolina), mandated modifications to nets because of turtles or by-catch issues, and mesh size. The net ban in Florida has been an important concern to fishermen in this region, with certain licensing implications, because they have witnessed Florida fishermen come into North Carolina, purchase vessels with commercial fishing licenses attached to them, and begin fishing in North Carolina. Because of this, fishermen here recommend against attaching commercial fishing licenses to vessels and license individuals instead.

Fishermen along the Outer Banks and from Wanchese are especially sensitive to the historical importance of their fisheries and related marine lifestyles, beginning with the shore-based whaling fisheries of the early colonial period and going through subsequent periods where fishing families provided life-saving services to hundreds of ships that make up the "Ghost Fleet" of the Outer Banks. Fishermen we interviewed here mentioned the importance of this history in terms of the memories of old fishermen. One claimed, for example, that there have been periods in local fishermen's pasts that they had to migrate to Florida because of declines in local fish stocks, making the argument that regulations need to consider extreme fluctuations in fish stocks as part of the economic hazards of commercial fishing. This same fishermen noted the importance of life-time experience in fishing and of the difference between knowledge gained through direct

experience and knowledge gained through scientific methods; the latter, of course, may suffer from sampling biases, while the former may suffer from other kinds of biases (economic, political, religious, etc.), yet combining the two could far better inform the regulatory community than sole reliance on one or the other.

The heavy dependence on Wanchese as a fishing community demands special attention in this section. Seven principal families of seafood dealers ring the seafood industrial park and serve as the central locations of the estimated 200 fishing families who live in Wanchese as well as anchor the southern marketing behaviors of fishermen from as far away as New Bedford, Massachusetts and Portland, Maine. The fleets that originate from here, and the fishing activity focused by the seafood dealers and the ports, concentrate around the seafood industrial park and fleets of trawlers organized or encouraged by seafood dealers in ways similar to those fleets organized by processors in the Albemarle and Pamlico crab fisheries. As one leaves Wanchese, however, more independent, owner-operator fishing operations prevail, with some long-time loyalties between fishermen and fish dealers that hinge on the questions of slip space and access. In recent years, fishermen in this region have become increasingly concerned that real estate development will entice dealers to sell their space to developers less interested in commercial fishing than in providing marinas and condominiums for recreational boating traffic.

Summary of Regional Differences and Similarities

- Commercial fishermen in all regions concerned about water quality, but the specific dimensions of those concerns differ by region.
- Commercial fishermen in all regions are concerned about increasing leisure and recreational uses of the coast, but specific dimensions of concern differ by region.
- Regions vary primarily in the species targeted and gears used.
- Relations between harvesting and processing sectors in Pamlico and Albemarle regions distinct from other areas, due to fleet development.
- Incidence of Part-Time commercial fishing varies across regions, usually related to proximity to urban areas (and employment opportunities).
- Flexibility index varies across regions (inland fisheries somewhat more specialized than coastal/ barrier island fisheries).
- Regulations will have different impacts in different regions.

V. Classifying North Carolina Fishermen

From the in-depth interview data, issues raised and discussed in the focus groups, and the data from the cultural mapping protocols and other research instruments, we have isolated several features that define North Carolina fishermen. Classifying and licensing North Carolina fishermen at the two extremes of full-time commercial or entirely recreational is relatively easy. Clearly, someone who derives all of his or her income from commercial fishing is a full-time commercial fisherman, just as someone who derives no income from fishing, yet fishes up to forty or fifty days per year, is a recreational fisherman. The latter neither needs nor desires an endorsement to sell; the former cannot survive without one.

It is between the two extremes of full-time commercial or entirely recreational that the difficulty of classification arises, as well as within the full-time commercial fishing population regarding factors such as the number of fisheries and gears fishermen participate in, the social problems they face, and the ways in which they are likely to be impacted by new regulations. The following classification system, based, of course, on data presented above, addresses these issues. These data suggest, first of all, that classifying fishermen in North Carolina depends of combining several variables, some of which indicate different degrees of involvement in fishing and some of which indicate qualitatively different fishing strategies, behaviors, and motivations. With each of the classes of fishermen listed below, we describe them by characteristics that indicate their dependence on the state's marine resources and how they identify themselves as fishers, what they perceive as the primary social problems making life difficult for them, their most desired and most feared regulations, and the probable impacts of relevant regulations proposed by the moratorium steering committee. Thus, we present information about each class of fishermen as follows:

Class of Fisherman

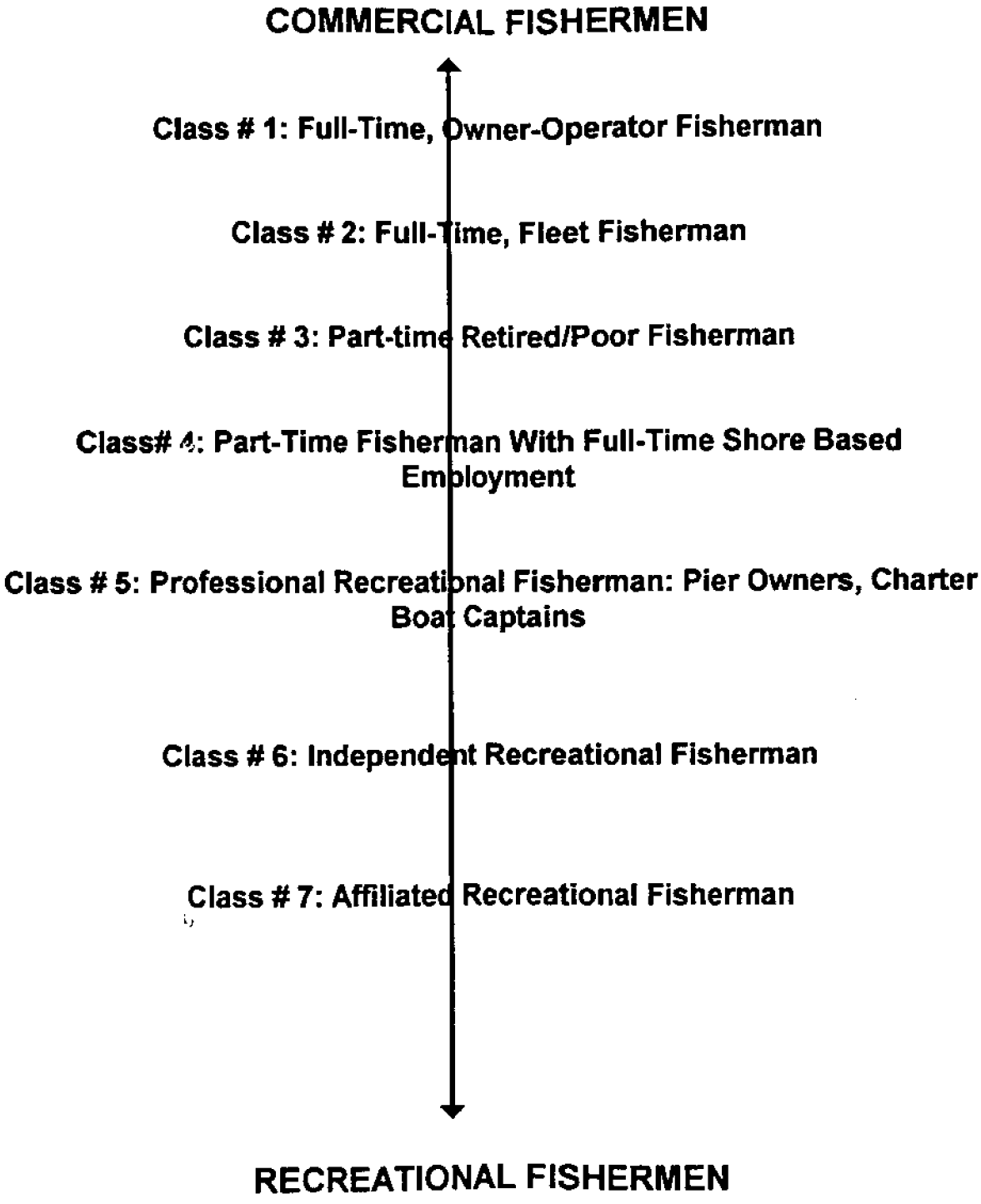
- *Motivation for fishing (income, subsistence, recreation)*
- *Percentage of income derived from fishing*
- *Time Commitment (months/year, years of experience, etc.)*
- *Flexibility index (number of species able to fish, gears/vessels, territories, etc.). High, medium, low: a high flexibility index would derive from someone who fished for two or more species with two or more gears from two or more vessels in two or more territories; a medium flexibility index would derive from a combination of two of the above behaviors (e.g.*

fishing for two species from two vessels in a single territory with a single gear); a low flexibility index would derive from a highly specialized fishing operation, such as the menhaden fishery.

- *Number of different kinds of vessels*
- *Number of others (e.g. crew) involved in fishing operation*
- *Relationship to the seafood marketing/processing sector*
- *Principal social problems*
- *Principal biological issues*
- *Most desired regulations*
- *Most disruptive regulations*

Figure 3 shows the seven classes we isolated based on the above data:

Figure 3. Classes of North Carolina Fishermen



These classes of fishermen/fishing families range from full-time commercial (the steering committee's "professional" fishermen) to purely recreational. Most of these classes are based on observations of and conversations with fishermen; recommendations regarding licenses, however, are oriented toward what we perceive to be the Steering Committee's charges of: 1) professionalizing the fishery; 2) increasing the ability to monitor fishing activity; and 3) protecting the resource.

The characteristics of these classes of fishermen follow. However, it is important to note that these are ideal categories in the sense that there will be exceptions to each of the classes.

Class # 1: Full-time, owner-operator (varies by region) "Professional Fishermen."

- **Motivation:** income (primary source).
- **Percentage of income:** >75% of the income of the person who fishes in the household; 50% or more of total household income, averaged over past five years.
- **Time commitment:** >9 months per year on the water (4-5 days/week, weather permitting); 5 or more years of experience.
- **Flexibility index:** medium to high (depending on the region; those in the Pamlico are less flexible than those in Carteret and Eastern Dare, for example).
- **Number of different kinds of vessels:** usually >1.
- **Number of others involved in fishing operation:** 1-3 crew, with active involvement of family members. In particular, the majority of these fishermen have spouse who have been politically active, as well as take a participatory interest in the fishery (e.g. keeping books, dealing with dealers, becoming part-time, occasional, or full-time mates on vessels).
- **Relationship to the Marketing/ Processing Sector:** independent, often based on personal loyalty or past or current credit relations; influenced by access (dock space); continual attempts to pioneer/explore new marketing options, including acquiring dealer's licenses and selling own catch directly to consumers.
- **Principal Social Problems:** Crowding/ space & territory problems (including access problems in some locations); part-time commercial fishing; negative public image, based largely on misperceptions or the isolated behaviors of irresponsible few; conflicts with

organized recreational fishing/leisure interests; gear conflicts; widespread perceptions that their way of life being criminalized.

- **Principal Biological Issues:** Water quality degradation from several sources ("dead water," *pfiesteria*, etc.); discrepancies with state biologists regarding stock assessments; overpopulation of some species (e.g. striped bass), collapse of others (e.g. oysters). Lack of appreciation of their ethnobiological knowledge base and folk theories about relationships between fishing practices and environmental health (e.g. trawling is similar to plowing a field); observers/ monitors of the state's marine resources.
- **Most desired regulations:** More intense regulation of industrial, agricultural, and government/ municipal threats to water quality; limits ETSs to full-time commercial fishermen; protection of nursery areas; equitable gear restrictions (e.g. pot reduction proposals in Pamlico region).
- **Most disruptive regulations:** net bans; quotas (including ITQs); time/season closures that lead to intense fishing/ crowding on opening days and fishing in unsafe conditions.

Class # 2: Full-time, fleet fisherman.

- **Motivation:** income; supplemental income.
- **Percentage of income:** >50% of the income of the person who fishes in the household; 20-50% or more of total household income
- **Time commitment:** >5-7 months per year on the water (4-5 days/week, weather permitting); 3-5 or more years of experience.
- **Flexibility index:** low.
- **Number of different kinds of vessels:** 1, sometimes owned or financed by a processor/dealer.
- **Number of others involved in fishing operation:** varies with the size of the operation (e.g. menhaden operations or the large blue-crap operations may involve the employment of dozens of workers, including processing workers; smaller operations might involve only two or three other fishermen).
- **Relationship to the Marketing/ Processing Sector:** dependent, based on wages or shares.

- **Principal Social Problems:** Crowding; part-time commercial fishing; negative public image, based largely on misperceptions or the isolated behaviors of irresponsible few; conflicts with organized recreational fishing/leisure interests; gear conflicts; widespread perceptions that their way of life being criminalized.
- **Principal Biological Issues:** Water quality degradation from several sources ("dead water," *pfiesteria,* etc.); discrepancies with state biologists regarding stock assessments; overpopulation of some species (e.g. striped bass), collapse of others (e.g. oysters).
- **Most desired regulations:** More intense regulation of industrial, agricultural, and government/ municipal threats to water quality; protection of nursery areas; equitable gear restrictions (e.g. pot reduction proposals in Pamlico region).
- **Most disruptive regulations:** restrictions on imported labor (in processing houses); time/season closures that lead to intense fishing/ crowding on opening days and fishing in unsafe conditions.

Class # 3: Part-time Retired/Poor Fisherman

- **Motivation:** supplemental income; subsistence; recreation.
- **Percentage of income:** >75% of the *earned* income of the person who fishes in the household; 50% or more of total household *earned* income; as important as other sources of household income, proportionately (e.g. if fisherman earns income from five sources, fishing income would make up around 20% of household income).
- **Time commitment:** Intensity of fishing varies by age and other time commitments; 1 or more years of experience.
- **Flexibility index:** low
- **Number of different kinds of vessels:** 1.
- **Number of others involved in fishing operation:** 0-1.
- **Relationship to the Marketing/ Processing Sector:** usually independent, often based on personal loyalty or past or current credit relations; influenced by access (dock space).
- **Principal Social Problems:** Crowding/ space & territory problems; gear conflicts.
- **Principal Biological Issues:** Water quality degradation from several sources ("dead water," *pfiesteria*, etc.).
- **Most desired regulations:** More intense regulation of industrial, agricultural, and government/ municipal threats to water quality; protection of nursery areas; equitable gear restrictions (e.g. pot reduction proposals in Pamlico region).
- **Most disruptive regulations:** Limits on ETSs based on total household income from earned and unearned sources; time/season closures that lead to intense fishing/ crowding on opening days and fishing in unsafe conditions.

Class # 4: Part-time Fisherman With Full-Time Shore-based Employment.

- **Motivation:** supplemental income; some subsistence.
- **Percentage of income:** <50% of the income of the person who fishes in the household and household income.
- **Time commitment:** 3-4 months per year on the water (1-3 days/week, weather permitting); 5 or more years of experience.

- **Flexibility index:** low to medium.
- **Number of different kinds of vessels:** usually 1.
- **Number of others involved in fishing operation:** 0-1.
- **Relationship to the Marketing/ Processing Sector:** independent, but often sell to only one or two dealers/processors.
- **Principal Social Problems:** Crowding/ space & territory problems (including access problems in some locations); conflicts with organized recreational fishing/leisure interests; gear conflicts.
- **Principal Biological Issues:** Water quality degradation from several sources ("dead water," *pfiesteria,* etc.). Problems with infrequent tending of gear.
- **Most desired regulations:** More intense regulation of industrial, agricultural, and government/ municipal threats to water quality; maintenance of status quo, allowing anyone to receive ETS.
- **Most disruptive regulations:** limits on ETSs to full-time commercial fishermen; quotas (including ITQs); time/season closures that lead to intense fishing/ crowding on opening days and fishing in unsafe conditions.

Class # 5: Professional Recreational Fishermen: Pier Owners & Charter Boat Captains.

- **Motivation:** primary income.
- **Percentage of income:** >75% of the income of the captain/ pier owners; 50% or more of total household income.
- **Time commitment:** varies seasonally, with peak seasons for both groups being in the summer months and sporadic periods of intense activity through the year (e.g. tuna fishing, spot run).
- **Flexibility index:** low
- **Number of different kinds of vessels:** 0-1.
- **Number of others involved in fishing operation:** varies according to patronage.
- **Relationship to the Marketing/ Processing Sector:** n/a

- **Principal Social Problems:** crowding during summer months (e.g. surfers near piers; jet skiers in the path of charter boats, etc.). Perceived problems with enforcement.
- **Principal Biological Issues:** beach erosion, inlet stabilization, etc.
- **Most desired regulations:** increased enforcement.
- **Most disruptive regulations:** licensing of patrons, particularly out-of-state patrons.

Class # 6: Independent Recreational Fisherman

- **Motivation:** recreation & subsistence.
- **Percentage of income:** marginal to none.
- **Time commitment:** 1-4 days per month.
- **Flexibility index:** low
- **Number of different kinds of vessels:** 0-1.
- **Number of others involved in fishing operation:** 0-4
- **Relationship to the Marketing/ Processing Sector:** n/a
- **Principal Social Problems:** crowding during summer months; gear conflicts (with gears that tangle or interfere with hook & line).
- **Principal Biological Issues:** perceived declines in stocks; water quality.
- **Most desired regulations:** increased enforcement; conservation of fish stocks; restrictions on gears that interfere with hooks & lines.
- **Most disruptive regulations:** saltwater recreational license that costs more than $10.00.

Class # 7: Affiliated Recreational Fisherman

- **Motivation:** recreation & subsistence.
- **Percentage of income:** marginal to none.
- **Time commitment:** 1-4 days per month.
- **Flexibility index:** low
- **Number of different kinds of vessels:** 0-1.
- **Number of others involved in fishing operation:** 0-4
- **Relationship to the Marketing/ Processing Sector:** n/a

- **Principal Social Problems:** crowding during summer months; gear conflicts (with gears that tangle or interfere with hook & line); navigational problems due to fishing and other vessels.
- **Principal Biological Issues:** perceived declines in stocks; water quality.
- **Most desired regulations:** increased enforcement; conservation of fish stocks; restrictions on gears that interfere with hooks & lines; saltwater recreational fishing license; closures of areas and season to commercial harvests.
- **Most disruptive regulations:** restrictions on recreational boating.

VI. Conclusions

The distinctions noted in the above classification system are important to the development of a new licensing system and to predicting the impacts of various regulations. Among the more important distinctions within both commercial and recreational populations of fishermen is the distinction between the individual or family fishermen and the corporate entity that represents large numbers of fishermen. In the recreational sector, this is the distinction between the individual angler and the pier owner or charter boat captain; in the commercial sector, this is the distinction between the owner-operator and the fleet fisheries organized, usually, by seafood dealers or processors.

Specifically, minutes of the moratorium licensing subcommittee suggest that the question of how to license firms—economic entities representing several fishermen—is among the more difficult issues they face. Within the commercial sector, for example, several questions have arisen along these lines. Whom should the state license? Only commercial fishermen themselves, who fish from their own vessels? Commercial fishermen and crew? Should companies be allowed to hold licenses that they could transfer among captains within the firm, or should the individual captains be licensed similar to independent fishers? Most commercial fishermen we have interviewed agree with the licensing subcommittee that the individual should be the primary license-holding unit, as opposed to the firm.

There is a great deal of concern in the state that the licensing system not harm small, family based commercial fishermen nor restrict access to the state's fishery resources among recreational fishermen who have long utilized fishing as a means of relaxation and food. Many believe that the character of the fishing enterprise and the number of individuals required to

operate it, and their stake in its operation, should be reflected in the license one holds. This applies to the recreational sector as well. How should charter boat captains, their patrons, and pier owners and users be licensed? Among the proposals are annual fees of around $500 for the recreational site owner (e.g. pier owner, charter boat captain) or a per person fee of around 50 cents. Should recreational fishers using gears that are customarily used commercially be required to have a separate license?

These questions raised by the subcommittee suggest that, within both the commercial and recreational sectors, one of the central problems that needs to be addressed is the treatment of the individual/independent fisher vs. the treatment of the corporate entity, or the single firm or individual who represents several other fishers—as crew, captains who work for him/her for shares, or patrons of recreational fishing businesses. Presumably, those representing corporate entities put more effort on the resource by organizing fleets or providing a basis for increased public access to (from piers and charter boats) and use of marine resources. Questions of fishing effort, of course, are related to the continued health of the state's marine resources, and the logic of varying levels of effort being reflected in licensing systems is the same as different fee structures for licenses issued to trucks engaged in commerce vs. private automobiles, because the trucks presumably cause more wear on state roadways.

The above observations are important because the fishing effort issue is the most pressing issue for a conservation-minded licensing system. The two primary dimensions of fishing effort that most fishermen in the state would like to see addressed are:

1. Reducing current levels of effort, particularly those that lead to space conflicts and those that are seen as harmful to the reproductive habits of fish and shellfish.
2. Preventing future levels of effort that threaten the resource (e.g. reproducing the current problems).

The first of these problems can be solved by phasing out certain classes of fishermen noted in the above classification system and, by extension, phasing out fishing practices that threaten the resource. This would include, of course, issuing license based on factors such as individual fishing histories and income criteria, most likely resulting in severe restrictions on part-time fishing among those who cannot practice conservation measures because of time constraints (e.g. those who leave nets and traps unattended). It is light of these issues that we present the following

information regarding the probable impacts of various regulations. We emphasize that these are designed to be models for considering the ways in which the classification system and the other data presented above may be helpful to fishery managers in weighing changes in fishery regulations:

Probable Impact of the Imposition of a Saltwater Recreational Fishing License

- Will Receive Support from Class # 7 Fishermen, but opposition from Class # 5 & 6 Fishermen. As noted earlier, anglers who belong to clubs are highly likely to support a saltwater recreational fishing license, while independent fishermen are less likely to support it and professional recreational fishermen —charter boat captains and pier owners—nearly uniformly against licensing their businesses as an additional tax and financial burden. Nevertheless, upon additional probing, most fishermen agree that all fishermen, whether commercial or recreational, should bear the costs of maintaining the fisheries, citing that they be used to conserve fish resources, enable better enforcement, and support limited fisheries research. We assert the following based on this.
- The state legislature or appropriate legislative committee can reduce opposition to licensing with assurances that fees will be used for resource enhancement and enforcement.

Impacts of Restricting ETS by 50% Earned Income Criteria

- Class # 4 Fishermen most negatively affected, but extent of negative impact will vary by region. Part-time fishing was perceived to be more of a problem close to urban areas than in rural areas, probably because of on-shore economic opportunities, although many of the crabbers in the Albemarle and Pamlico regions—areas considered predominantly rural—objected to part-time crabbing due to crowding of traps.
- Class # 3 Fishermen will not be affected if 50% based on "earned" income. Most retirement income is not considered earned income, and that income retirees and impoverished households make from fishing would, it is likely, come to more than 50% of total earned income.
- Will address problems of too much gear and crowding.

- May indirectly address problems of unattended gear (by reducing numbers of Class # 4 fishermen, whom full-time fishermen cite as responsible for unattended gear). Solving the problem of unattended gear may have an additional benefit of improving the image of fishermen in the public eye. Seeing unattended gear in the water, seeing dead fish in nets for example, reflects badly on all commercial fishermen for the behaviors of an irresponsible few.

Impacts of Restricting Fleet Development

(Problem of Single Individual Hiring Several Fishermen to Fish from Individual's Vessels Using Individual's Gear)

- Class # 2 Fishermen will be negatively impacted. Many of the fishermen in this group depend on processors for access to vessels and gear, functioning as employees of processing and seafood dealer firms.
- Pamlico and Albemarle Regions will be more severely impacted than other regions. Because of the concentration of blue crab processing plants in these regions, and the recent pressures put on the crab resource from new access to temporary foreign workers, fleet development has proceeded in these regions more rapidly than others, although the community of Wanchese may also be impacted negatively.
- Processing/ Dealer sector will oppose, in particular through the North Carolina Fisheries Association, which has long served the interests of the processing industry.
- Will address too much gear & crowding problems, reducing in particular the large fleets currently assembled by processors.
- Return to Credit/ Debt relations possible. With the reduction in numbers of vessels and numbers of crabs that an individual can fish, we can expect a return to disguised wage labor relations, as processors establish individuals fishermen as owner-operators, providing them with loans or credit for vessels, gear, or trip expenses, in return for loyalty.

Impacts of Licensing Commercial Fishermen for Participation in One Fishery at a Time

- Class # 1 fishermen will be most negatively affected. Again, these fishermen rely on shifting among different gears and species through the year. "Boxing them in," as they refer to this

process, would severely restrict their capability to respond to new fishing opportunities through the course of the season.

- Will vary by region, based on flexibility index (Carteret & Eastern Dare most negatively affected)
- Will displace those (Class # 1) fishermen who monitor the resource on a daily basis through the year.
- Will erode folk knowledge about the resource. Class #1 fishermen, usually descending from long-time fishing families in the state, possess a great warehouse of folk knowledge about the resource, based on generations of observation, and are uniquely qualified to observe and monitor such things as water quality, the conditions of fish and shellfish populations, and problems with nursery areas and substrates. We qualify this by saying that this knowledge may not always be entirely accurate, and that it may be biased by economic concerns. Nevertheless, interviews with owner-operator commercial fishermen reveal that they pay close attention to the resource and, as such, police the resource in a way that few other public or private interests can match.

While the above impacts address current problems in the fisheries and the probable impacts of several solutions that have been suggested by various marine resource regulators over the past year, the future of North Carolina fisheries remains in doubt. How can a licensing system and other mechanisms be developed to preserve the fisheries and manage them in ways that are not too devastating to any of the important sets of participants. In particular, on what grounds will new fishermen be allowed into the fisheries? This is the famous question of limited entry. Based on this study, we suggest that entry into the state's fisheries be patterned after the principal method by which fishermen have entered North Carolina fisheries for centuries: apprenticeship. Historically, fishermen learn fishing and learn about the ecological cycles of North Carolina's estuaries and open waters from other fishermen, working long hours as crew with those who have practiced the waterman's way of life several years, often for their entire lives. If an apprenticeship system were put into place, the question remains of who would allowed to participate in the system. Again, this is a limited entry issue, an issue which several states have experimented with in various ways based on various criteria.

Hence, for developing limited entry as well as other regulation-setting mechanisms, it may be instructive to look to other state's experiences, despite that many fishermen agree that North Carolina's unique estuarine system and history make it substantially different from other states. While this may be true in terms of comparisons with many states, such as Florida, Texas, and Alabama, North Carolina shares enough features with a few other states to warrant consideration of their licensing programs. Once state with which North Carolina shares historical, ecological, and social characteristics is Maine. The recent experiences of Maine in terms of regulating their fisheries are important to North Carolina's current difficulties because they recognize regional differences within the state and embrace a co-management approach, with fishermen and fishery managers coming together to draft, vote on, implement, and enforce regulations.

Several similarities between Maine and North Carolina recommend Maine's recent efforts for the development of a regional approach to fisheries in the state. These include:

- Historical and Ethnic similarities. Both states were founded as English colonies that attracted large number of individuals of Scotch-Irish descent, many of whom arrived as indentured servants and established themselves as pioneers after working off their contracts of indenture. In both regions, as well, fishing communities, financed in part by merchant capital in England, paved the way for the development of coastal communities.
- Similar Fisheries. Both states' fisheries are based on a principal shellfish caught by means of traps (lobster in Maine, blue crab in North Carolina) with several other shellfish and finfish species: flounder/groundfish, herring, scallops, eels, clams. In addition, the lobstering fleets of Maine are similar to the blue crab fleets of North Carolina, in that they set traps from boats in the 30 to 45-foot range, operating from several sheltered ports principally during the summer months and either reducing fishing effort during the height of the winter or shifting to alternative fisheries (gillnetting, scalloping, shrimping). Dealers and fishing cooperatives dominate much of Maine's marketing outside of Portland, trading dock space, credit, and access for fishermen's loyalties.
- Annual rounds of shifting between different gears and different fisheries. As just noted, Maine fishermen have what we have referred to here as medium to high "flexibility indices," often using more than one gear to target more than one species, although less often do Maine

fishers have more than one fishing vessel (they have small crafts to take them out to where their larger vessels are moored in the harbors, however).

- Regional distinctions (Portland v. Machiasport is similar, say, to the distinction between Wanchese v. Oriental). While Portland is dominated by a groundfishing fleet of fairly large, 75' to 100' vessels outfitted primarily for groundfishing, the smaller ports of the "Down East" region (east and north of Bath and Rockland) in Maine are home to smaller vessels in the 30' to 45' range or the 45' to 75' range that scallop, groundfish, lobster, shrimp, dive for urchins, etc. through the year. There are large urban ports similar to the Morehead City/Beaufort complex and rural ports similar to Frog Island.
- Similar problems of access to coastal areas and controversies with recreational/ tourist interests. Although in Maine the issues are somewhat different, with whale-watching firms and marine mammal protection groups organizing against commercial fishermen, in both states the regulations entangling fishermen have created the sense among many of them that their way of life is being criminalized. As a consequence, they have begun considering developing regulations on their own, as North Carolina fishermen have (e.g. herring fishers in the Albemarle region coming together to voluntarily reduce their numbers of nets).
- Ecological similarities. Although sharp differences exist regarding the *specific* ecologies of the two states (Mike Street, personal communication), both states have open, extensive fishing grounds (Pamlico Sound, Gulf of Maine) and numerous nursery/ estuary areas that provide sheltered harbors. Both states have been blessed with a wide variety of fish and shellfish species, many of which are similar (shrimp, eels, flounders, etc.).

These similarities make considering Maine's experiments with fishery management relevant to North Carolina. In particular, Maine's model of Regional Councils, which separate the state's fisheries into five distinct zones, seem especially well-suited to North Carolina, given the regional variation outlined in the previous sections. Maine's model, currently being put into place for the lobster industry, to serve as a model for community based fishery management in other fisheries (James Wilson, personal communication), consists of the following:

- First, as just noted, Maine recognizes regional distinctions between fisheries in state based on historical and ecological characteristics. These regions reflect groups of fishermen who are

similarly placed with regard to their interactions with the marine resources. That is, they practice similar mixes of gears and target species and have, historically, interacted with fishermen from other communities within the zones, to define, protect, and defend their territories (Acheson 1987).

- Like North Carolina's five regions discussed above, Maine recognizes five zones. Each of these zones has its own regional council who are elected for three-year, staggered terms through a process that involves: a) identifying stakeholders with current licensing data; b) voting in annual elections. The number of council members varies by the size of the zone, with council members representing 100 or fewer license holders.
- Each regional council develops proposals for changes in fishing rules which are then voted on by all fishermen in the zone. Changing any fishing rule requires that two-thirds of region's fishermen agree on the change. Rules that are decided upon by regional councils include those governing numbers and types of gear and time regulations (seasons, numbers of days one can fish, etc.) The zone model allows for sub-zones to exist within zones for finer regulations that recognize more localized circumstances.
- Perhaps most important, the Maine model is one of participatory co-management, with state entities—specifically, the Marine Fisheries Commission and the Department of Marine Resources—and fishing interests coming together to develop proposals for changes in fishing regulations. This consists, essentially, of a "bottom-up" meets "top-down" model in which lines of communication between the state and fishing groups, and among fishing groups, have become institutionalized.
- Fishermen can fish in more than one zone, but must abide by the most restrictive zone's regulations. This solves problems of fishermen from different communities coming into distant waters with gears and fishing methods that local fishermen deem destructive to the resource.
- Finally, the National Marine Fisheries Service has begun to consider Maine's model as innovative; to the extent that they recognize this, they may begin the long and arduous process of creating more coherence between state and federal fishery regulations.

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APPENDIX A:
RESEARCH INSTRUMENTS

A. Recreational Fishing Survey Instrument

ID_____
Date & Time:_____
Location:_____

RECREATIONAL FISHING SURVEY

Introductory Statement (paraphrase): *We are conducting a survey as part of a study of fishing in North Carolina for the North Carolina Moratorium Steering Committee. We would like to ask you about twenty minutes worth of questions about your recreational fishing activity. Your participation is entirely voluntary.*

Fishing Location:

When you recreationally fish, do you most often fish from: a) beach or bank; b) manmade structure (pier, jetty); c) private boat; d) charter boat.

Do you most often fish in the: a) rivers ; b) sounds; c) in-shore ocean waters (1-3 miles); d) off-shore waters (>3 miles)

Do you most often fish in saltwater or freshwater? Salt Fresh

Is there a name for the place you fish, recreationally, most often (e.g. Mercer pier; Gulf Stream, etc.)? Y N If Yes:_____

Fishing/Sportsman avidity:

About how many days per year do you fish recreationally (in saltwater)? ___ ___ ___

About how many hours will you spend fishing today? ___ ___

Do you take extended fishing vacations or have any fishing traditions that you follow year after year (e.g. night fishing for red drum, coming to the coast for the spot run)? Y N
If yes, please describe:

Do you subscribe to any saltwater sportsfishing or other recreational fishing magazines? Y N

Do you belong to any recreational fishing club, like the ACCA? Y N If Yes:_____

Do you attend club meetings? N Yes, regularly. Yes, but irregularly.

Do you belong to any conservationist organization, like the PTRF? Y N If Yes:-

Have you ever attended a public hearing, contributed money, signed a petition, or otherwise participated in a campaign to:

a) curtail or challenge commercial fishing practices? Y N

b) curtail or challenge coastal development (e.g. condominium development)? Y N

c) curtail or challenge coastal industry (e.g. paper manufacturing, mining)? Y N

Have you ever fished in a fishing tournament? Y N If Yes, what tournament:_____

Do you have a freshwater fishing license? Y N

Do you have a hunting license? Y N What animals do you hunt? _____

About how many days per year do you hunt? ___ ___ ___

Species, Gear, and Disposition of the Catch:

Do you usually fish for any particular kinds of fish or shellfish? Y N

If Yes, what fish/fishes?_____

[Probe for "core" and "secondary" types]

Do you usually fish with a hook and line? Y N If no, what do you usually use?_____

Do you use any commercial fishing gear (e.g. shrimp trawl, crab pots)? Y N

If yes, what gear: _____

Do you utilize commercial fishermen for any of the following: a) bait; b) information about gear; c) information about fishing locations; d) information about markets for fish; e) other.

Do you own your own boat? Y N If yes, what length it is? ___ ___ ft.

Describe vessel (e.g. Sea Ox):_____

What do you normally do with the fish you catch?

% eaten_____ % given away_____ % sell/trade_____ % other_____

On average, how many days per week do you and your family eat the fish that you catch?

___

Attitudes Toward a Saltwater Fishing License:

Do you think there should be a saltwater fishing license in North Carolina? Y N

Yes, but under certain conditions

(specify):_____

Assuming the fees from a saltwater fishing license went to pay for programs you supported, how much would you be willing to pay for such a license?

$6.00 $7.00 $8.00 $9.00 $10.00 $11.00 $12.00 $13.00 $15.00 $20.00 $25.00

Do you believe that stamps on licenses, similar to stamps to hunt certain kinds of animals and birds, would be effecting in controlling fishing effort? Y N

If there were a saltwater fishing license in North Carolina, how do you think the fees from a the license should be used? (circle all that respondent supports)

a) enforcement of fishing regulations; b) conservation measures; c) fisheries research;

d) other

Agree/Disagree Statements:

1. Regulations should apply to everyone, whether commercial or recreational fisherman. **agree disagree**

2. The only way some of the major species will survive in the sounds is to ban both the commercial and recreational take of these species. **agree disagree**

3. Any depletion in stocks is due more to pollution problems and habitat degradation than overfishing by commercial or recreational fishing. **agree disagree**

4. Increasing tourism and weekend residents are putting more pressure on the fish and shellfish stocks than commercial fishermen. **agree disagree**

5. Even though sport fishermen are harvesting fish too, most of the regulatory burden falls on the shoulders of the commercial fishermen. **agree disagree**

6. The commercial fisherman can't hardly fish because there are so many sportsmen. **agree disagree**

7. Recreational fishermen need to help pay to keep up the fisheries. **agree disagree**

8. There are abuses by both the recreational and commercial fishers. **agree** **disagree**

9. The problem between recreation and commercial groups is not a matter of conservation of resources, but is really more a matter of allocation of these resources. **agree** **disagree**

10. Sportsfishermen spend significantly more dollars per fish caught than commercial fishermen and are, therefore, more economically important to many local economies. **agree** **disagree**

11. There is little hope for compromise between commercial and recreational fishing interests in this state. **agree** **disagree**

Demographics:

1. Gender _____
2. Age _____
3. Place of residence _____ (Where do you currently live?)
4. Ethnicity _____ (Do you consider yourself:
   a. Caucasian/White __
   b. Hispanic __
   c. Black __
   d. Asian __
   e. Other _____)

5. Education (What is your highest level of education, including any technical training? NOTE: Probe for exact year or level. Mark numeric value)
   A. Grade school level ___
   B. High school level __
   C. College # of years _____ Degree_____
   D. Graduate or professional school level # of years ___ Degree _____
   E. Tech School (specify) _____

6. Marital status (What is your current marital status?)
   A. Single, never married __
   B. Separated __
   C. Divorced __
   D. Widowed __
   E. Married __
   F. Other _____

7. Children Yes ___ No ___
   A. Number of sons ____ (How many sons?)
   B. Number of daughters ___ (How many daughters?)

8. Number of people living in household _____ (How many people live with you on a permanent basis including yourself?)

9. Number of working persons living in household _____ (Of those living with you, how many contribute income to the household including yourself?)

B. Ethnographic Protocol for In-Depth Interviews

INTERVIEW PROTOCOL: NORTH CAROLINA COMMERCIAL FISHING FAMILIES

Although these interviews are designed to be open-ended, they are not totally free-ranging. We want information on a selected range of subjects, as outlined below. Those words in boldface print reflect important attributes of the fisheries: for example, the fact that the word 'households' is in bold face reflects that fact that the interviews should focus on the behaviors of all members of the household, not just the fisherman.

Whenever possible, tape the interviews, but make sure that the tape can be transcribed..

<u>In-depth interviewing of commercial fishers and members of their households</u>

These interviews are oriented toward determining, in particular, the social **impacts of regulatory scenarios** on specific **groups of fishing families** and **fishing operations.** In part, this work will involve developing **life histories or biographies** of fishing households and operations, paying particular attention to the ways they have responded to past changes in the fisheries that provide them with income.

Because we are considering the household the unit of study, we should think about the household's **life cycle** in structuring our interviews. We should already have information on the size and composition of the household, but we are eliciting additional information on the ways that the household has changed over time—demographically, economically, socially, and politically—and how the changes it experienced: 1) affected their utilization of the coastal resources of North Carolina; and 2) might have been stimulated by changes in regulations, fishery stocks, gear conflicts, and so forth. For example, we want to assess changes in the fisheries against a background of information such as the following:

1. When was the household, as an entity that fishes in North Carolina waters, founded? Do all of the adults in the household come from fishing families? Do older, teenaged children fish and consider fishing as a viable lifestyle?
2. Contributions of household members to the fishing enterprise, including the contributions of individuals who work outside of the family fishing operation, either for other fishing enterprises or marine related jobs or in shore-based occupations.
3. Relationship between nonfishing and fishing employment over the past three to five years. This information will be collected at the level of the household, to determine such factors as the extent to which household members' nonfishing schedules conflict with fishing schedules, or nonfishing income is used to cover costs associated with fishing.

After we have collected basic information about the household, we want additional information on the following:

1. Responses to past crises in various North Carolina fisheries, including ecological crises (e.g. red tide), changing regulations (e.g. early closure of the herring fishery), or economic crises. It is best here to get specific information about a specific crisis. *Get them to recall, if they can, a specific crisis (conflicts over gear, closure of shellfish area, problems with crowding or the appearance of foreign fishermen on the water, problem with seafood marketing due to publicity about*

pollution, etc.), and then tell how they responded to the crisis. Did they engage in any political activity, join or form a group, or write a letter or call their local or federal congressman or senator? Did they respond in an economic way, taking on additional tasks to make additional money, fishing in other fisheries, using new gears...?

2. Knowledge about the resource, including "ethnobiological" knowledge and its importance to resource protection and conservation. Collecting this information is necessary because many fishers "police" resources they utilize by monitoring and reporting problems with marine organisms and water quality. The Committee needs to know whether or not regulations they impose will restrict fishers' abilities to monitor marine resources. *How did they learn about fishing, boating, and how to interact with the resource? Who taught them? In what ways do they see themselves as protecting or guarding the resource? Do they notice strange ecological conditions, such as the appearance of organisms they have never seen or sores on fish, even if they consider those fish by-catch? Probe for the ways in which they observe and monitor the resource—what we would call their methods.*

3. Attitudes toward licensing and responses to new licensing proposals being considered by the Licensing Subcommittee and DMF personnel. *We need to know, from them, how certain licensing proposals and other regulations are likely to affect them and their fishing effort. For example, what kinds of licenses or regulations, if any, would be in their best interests? If they say none, then ask them whether or not they would like to see the Venezuelan fleet in the Pamlico Sound. What kinds of licenses would be worst for them? What criteria should be used to issue licenses (50% of income, resident in the state, etc.)?*

4. The dynamics of crew recruitment and crew retention. *How do they recruit crew? Do they use the same individuals again and again? Are they simply younger household members or younger members of the community? Do they see any value in recruiting, say, Mexicans to work on their boats? Do they pay the crew in shares or in wages? How might crew licensing influence their current and future fishing strategies?*

5. Nature of relations with the seafood processor/dealer sector. *Do they rely on a single seafood buyer, or several? How long have they relied on those they sell to? What has been the history of that arrangement? Do they receive dock space, credit, etc.?*

6. Contributions to support sectors (e.g. marine suppliers, boat builders, credit institutions). *Are boat builders important to them? [Read the report's section on boat builders. pp. 18-19] Do they receive any supplies, fuel, other inputs from the people to whom they sell their fish and shellfish? What would be the impact of their withdrawal from the fishery on various support sectors?*

Remember that these interviews are designed to establish a data base for pursuing issues that fishermen and their families consider important in the context of focus groups. You should, then, determine whether or not they would be interested in attending a focus group, where such an event would be convenient to them (public setting, such as a nearby town hall), and what kind of scheduling constraints do they have. I include the following section, from the original proposal, for your benefit in thinking along these lines.

Organizing and moderating focus groups

Focus groups are small gatherings in which researchers guide and moderate the discussion by selecting topics for discussion. Yet one appealing attribute of the focus group is that the group itself may suggest avenues to pursue and raise issues independently of the researchers. Such settings are more conducive to the airing of views that might be considered too inflammatory or too trivial to raise in larger groups, but that reveal important positions regarding fishers reactions to proposed regulations. In addition, participants are likely to give more accurate information when others in the group can refine and expand on issues they raise.

Generally, between seven and twelve people are selected for participation in the focus group, and the selection criteria must be in concert with the objectives of the research and the topics being discussed. We anticipate organizing and moderating five focus groups, with the participants representing the most important fishery groups in the state and others with various kinds of interests in the state's fisheries (e.g. seafood processors and dealers). These focus groups will probe for detailed information on distinctive groups or classes of fishers within the state's fisheries, what regulations they believe are necessary to conserve the state's fisheries, how various groups are likely to react to or be impacted by various regulations, how licenses should be distributed and priced, what information should be included on the license, and so forth.

APPENDIX B:

LICENSING EXPERIENCES OF OTHER STATES

PART I: GULF STATES
(University of South Alabama Report)

PART II: EASTERN SEABOARD STATES
(Results of a Survey)

PART I: GULF STATES

An Overview of the Gulf States Commercial and Recreational Licensing Systems

by

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and

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Introduction

The purpose of this report is to describe and characterize the commercial and recreational licensing systems of the Gulf states and noting, in particular, their potential effectiveness in achieving management goals. Specifically, we devised a questionnaire to provide information on the following: (1) the commercial and recreational fisheries in each state; (2) gear allowances and restrictions in each state; (3) an historical overview of both the commercial and recreational licensing in each of the five Gulf states; (4) the effectiveness of the licensing system in each state as both a research and regulatory tool; (5) compliance and enforcement issues in each state; (6) the fee structure for licenses in each state; and, (7) the major problems the Gulf states are currently experiencing with their licensing system. The questionnaire is included as Appendix A.

The report is divided into 12 sections. The first section presents a list of the participants and their agencies. The second section is concerned with a general description of the commercial sector. Section 3 provides an overview of the recreational component for each state's licensing system. Fishing gear requirements and restrictions are discussed in section 4. In Section 5 a brief history of each state licensing system is presented. Sections 6 and 7 are concerned with the effectiveness of the state's current licensing system as a regulatory and a research tool. Sections 8 and 9 describe some of the administrative aspects of the Gulf states licensing system and include compliance and enforcement issues, fee structure. Section 10 describes problems the Gulf states are experiencing with their current licensing system. Section 11 includes a brief summary and analysis of this information. The final section is an ethnographic overview of user-groups opinions on the licensing systems in the Gulf states.

Part 1: Survey Participants

Interviews were conducted with individuals in each of the five Gulf states who were generally informed about their state's commercial and recreational licensing programs. Mr. Russell Nelson of the Marine Fisheries Commission for the State of Florida provided the information for Florida. Mr. Vernon Minton of the Alabama Marine Resources Division provided the information for the state of Alabama. In Mississippi, Mr. Russell Doucet of the Bureau of Marine Resources completed the survey for Mississippi. In Louisiana, Mr. Corky Perret of Louisiana Department of Wildlife and Fisheries provided the information. In Texas, the survey was completed by Mr. Paul Israel of the Texas Parks and Wildlife Department. The ethnographic component was compiled by Mark Moberg. He collected information from fishermen from each of the Gulf states.

Part 2: Description of the Commercial Sector

1. Types of Licenses and Major Fisheries

FLORIDA:

There are 10 different types of commercial licenses issued in the state of Florida. These include a general commercial saltwater products license, restricted species endorsement, wholesale and retail dealers license, specific category license, clam, blue crab, stone crab, spiny lobster, marine life (ornamental tropical fish and invertebrates) and a purse seine license.

ALABAMA:

In Alabama, there are 6 different types of commercial licenses: shrimp (trawl), gillnet, crab (trawl and traps), purse-seine, commercial hook and line and oyster. For gillnets, the top four fisheries are mullet, flounder, menhaden and Spanish mackerel, representing 90 percent of the value of this fishery.

MISSISSIPPI:

In Mississippi, there are 40 different types of commercial licenses. The three major fisheries for Mississippi are: shrimp, oyster and crab.

LOUISIANA:

Louisiana issues 62 different types of commercial licenses. Resident commercial fishermen, resident vessel license and resident shrimp trawl are the three major categories of license holders.

TEXAS:

The state of Texas issues 26 different commercial licenses and 2 tags. The major category of licenses include shrimp, oyster, crab (2 tags), finfish, and mussels and clams.

2. Part-time versus Full-time Participation

In both Florida and Texas there is a differentiation between part-time and full-time participation in the commercial sector. This is reflected in the fee structures such that full-time participants pay more for a license. However, for the Texas commercial sector, this distinction is made only in the finfish fishery and for commercial bay shrimp boats.

In both Alabama, Mississippi and Louisiana, no differentiation is made between full-time

and part-time participation in any commercial fishery

3. Resident versus Non-resident

For the Florida commercial sector, there is a restricted species endorsement for most fish species for both residents and non-residents. A distinction is made between resident and nonresident commercial fishers in Alabama, Mississippi and Louisiana. The price of the license is the most common way in which these two groups are differentiated. For example, the gillnet license is based on a 1 to 5 ratio. Alabama residents pay $800 for a commercial gillnet license while out-of-staters pay $4,000 for the same license. In some cases, the Alabama Marine Resources Division will charge a nonresident of a particular state what the state in question charges an Alabama resident for a license. This is referred to as a reciprocal agreement. Texas regulatory policy requires that individuals must reside in Texas continuously for more than 6 months before applying for a resident license.

4. Commercial Licensing Requirements

In Florida to qualify for a commercial license, individuals must prove that 25 percent of their total income is from fishing or at least $5000 of their total income is from the sale of commercial marine products. With the exception of gillnets, in Alabama, there are not any specific requirements for an individual to buy a commercial license. In the gillnet fishery, individuals must demonstrate involvement in the fishery for any two years between 1989-1993, and a 50 percent income requirement from commercial fishing. If fishermen have held a license each year between 1989-1993, the income requirement is waived.

In Mississippi, to buy a commercial license an individual must provide proof of boat registration or other forms of documentation. Or, in the specific case of a gillnet license, an individual must have purchased a license in one of the last five years.

To purchase any commercial license in Louisiana, an individual must provide a driver's license, voter's registration and social security card.

For a resident vessel license, the vessel must be registered as a Texas boat or the individual must provide documentation of a Texas address on USCG certificate of documentation. All other individuals or vessels are considered non-resident. Non-residents pay a higher fee for a license.

5. Issuance Requirements

For commercial fishermen in Florida, licenses are issued to both individuals and vessels, but not to crew members. Florida does not issue any type of fleet license for individuals who own more than one boat.

Shrimp vessels are licensed in Alabama. The boat may work out of Alabama, but if the owner is a Louisiana resident, then the license must be purchased in Louisiana. In all other cases, the individual or the corporation has to have a commercial license. Crew members are not required to be licensed in any of the commercial fisheries.

For Mississippi fishermen, the owner of the boat must buy the license, but anyone may use the boat. Mississippi does not issue fleet licenses. For Mississippi residents only, shrimp boat captains must buy a 10 dollar captain's license.

In Louisiana, both individuals and vessels are issued licenses. Vessels are licensed only for salt water. Louisiana does not issue fleet licenses for individuals who own more than one boat.

In Texas, individual licenses are issued for the various species of finfish, mussel and clam. Shrimp boat captains are also required to have a commercial shrimp boat captain's license. Vessels are licensed for shrimp, oyster and menhaden fisheries. Shrimp, oyster and menhaden boat licenses cover crew members. For all other species, crew members must have individual licenses. Texas does not issue fleet licenses.

Part 3: Description of the Recreational Sector

1. Types of Licenses and Major Fisheries

FLORIDA:

There are seven different types of recreational licenses issued. They are: general recreational fishing, snook and lobster stamps, guide, charter boat, head boat and pier licenses. For charter boats, the captains are required to be licensed. Pier owners may buy a 500 dollar license which allows unlicensed individuals to fish off the pier. State residents do not need a saltwater license if fishing from shore, whereas non-residents do.

ALABAMA:

In Alabama, there are five different types of recreational licenses: hook and line, recreational shrimping, pier license, individual pier license, and a trip license (1 week license for $5 which allows the license holder to fish inshore for spotted trout, redfish, and flounder and offshore for Spanish mackerel, king mackerel, red snapper, trigger fish, and vermillion snapper). Charter boat captains who fish state waters have to have a license for the vessel; if they fish exclusively in federal waters, they do not.

MISSISSIPPI:

In Mississippi, there are four different types of recreational licenses. These include: recreational shrimping differentiated for resident and nonresident, oystering only for state residents and crab, and a rod-n-reel license. The owner of the charter boat must purchase a $200 licenses. There are no specific licensing requirements for individuals who own piers but

individuals who fish off piers whether or not they own them must have a rod-n-reel fishing license.

LOUISIANA:

In Louisiana, there are 16 different types of recreational licenses. The most commonly sold are: resident saltwater fishing for the season, non-resident saltwater for 2 days and non-resident saltwater for the season. Charter boat captains are required to have a license as are individuals who fish off private and public piers.

TEXAS:

Texas issues 11 recreational licenses, 2 stamps and 3 tags. Examples of these include: resident combination hunting and fishing, resident fishing, temporary resident fishing (14 days), special resident fishing, non-resident fishing, temporary (5-day) non-resident fishing, saltwater sportfishing stamp, freshwater trout stamp, tarpon tag, red drum tag and saltwater trotline tag. Charter boats are required to have a fishing guide license and the individuals who charter boats are required to have a fishing license and/or stamps. There are not any licensing requirements for individuals who own fishing piers, individuals who fish off the piers are required to have a fishing license and/or stamp.

2. Residents versus Non-residents

Residents of Florida are exempt from licensing requirements if they are fishing from shore whereas non-residents must have a hook and line license.

In Alabama, there is a distinction between resident and nonresident recreational fishers. For Florida, Mississippi, Louisiana, Texas, Tennessee and Georgia, the Alabama Marine Resources Division has a reciprocal agreement. For all other states, the rates for recreational licenses are double what residents are charged. Individuals who charter boats need not have a recreational license for state waters. Individuals who own a pier can purchase a pier license and charge individuals to fish. Thus, the individual does not have to purchase a fishing license.

Mississippi residents pay a lower fee for licenses than do nonresidents but the state does have a reciprocal agreement with other Gulf states.

Recreational fishermen in Louisiana are required to have proper identification and residents of Louisiana pay a lower fee for a license than do non-residents of Louisiana.

To obtain a resident license in Texas, individuals must have resided in Texas continuously for more than 6 months. Residents and non-residents under 17 are exempt from the licensing requirements. Active duty military and dependents are considered residents regardless of where they reside.

Part 4: Gear Allowances and Restrictions

In Florida, there are specific allowances set for the recreational use of of traps. Recreational fishers may have up to five blue crab, lobster or stone crab traps. All gear, nets and traps are required to be tagged and must be checked every hour. If they are left unattended, they can be seized and the owner of the gear fined.

Alabama allows the following recreational and private use of commercial gear: gillnets (limited to 300 feet), shrimp trawls (recreational shrimper license), up to 5 crab traps and 100 pounds of oysters/day without a license. Commercially, gill nets are licensed, crab traps are not. Gillnets have to be constantly attended; if not, they will be confiscated. Recreational limits on commercial gear are related to size of the gear.

Mississippi does allow for the recreational use of commercial gear. For recreational shrimping, the net size is limited to 16 feet; up to 6 crab traps and for oystering 3 sacks per week. Crab traps must be tagged and attended every third day. For gillnets, these must be tagged and constantly attended. Unattended gear will be confiscated and the owner fined.

In Louisiana, commercial gear which may be used recreationally include: oyster tongs, crab traps and certain freshwater gear. Strike nets are required to be tagged and must be constantly attended.

In Texas, there are no allowances for the recreational use of commercial gear. Crab traps and saltwater trotlines must be tagged. If left unattended, traps and trotlines can be confiscated by the Game Warden.

Part 5: Historical Overview of the Licensing System

1. Process of Change to the Licensing System

In Florida, Alabama and Louisiana changes to the state's licensing system are made through the legislature. In Mississippi changes to the state's licensing policy are made through a seven member Commission. For Texas, changes may be made by the legislation or the Commission. The Commission may set fees but cannot create new licenses. In the case of Mississippi, the Department of Marine Resources can make recommendations for policy change to the state's licensing Commission.

2. Brief History of Commercial Licensing Sector

The development of a commercial licensing system in Florida came about because of a need for data collection and seafood safety enforcement. The commercial crab license has been in place for 13 years. Commercial gillnet fishing which had been in place for 13 years was outlawed

by a constitutional amendment as of July 1, 1995. This change was initiated by a concern expressed by conservation organizations that the continued harvesting of fish by gillnets would lead to over-fishing of many species of finfish. They also cited damage to the sea turtle population during the pompano season on the east coast of Florida. The amendment to ban net fisheries was introduced by Save Our Sealife and passed by a 72 percent to 38 percent margin in a general election.

While tentative at this point, Florida conservation organizations report that bait fish and sea trout have increased in numbers. Landings of mullet have radically decline. Former gillnet fishermen have had to look for employment opportunities onshore or in other fisheries and/or relocate to another area. As a result, it is expected that in the upcoming years, there will be an increase in the number of blue crab and stone crab fishermen as displaced gillnetters migrate to south Florida.

The commercial shrimp fishing license in Alabama has been in place for approximately 40 years; crab licenses have been required for 15 years; gillnet licenses, for 40 years. The commercial oyster fishery licensing system has been in place the longest since around the early 1900s. These various commercial licensing programs were started for the following reasons: to identify who is fishing and to support management and enforcement to ensure long-term health and conservation of the resource.

In Mississippi, the commercial licensing system for shrimp and oyster has been in place for 40 years; for crab, 25 years. The major reasons for the establishment of a licensing system were: for recording purposes, to monitor size of catch and number of pounds harvested. One major change in recent time, approximately 18 years ago, has been to issue shrimp licenses based on boat size. Mississippi residents who captain shrimp boats are now required to purchase a separate captain's license. This was done to cut-down on illegal shrimping practices in rivers. Captains caught violating this law could be fined up to $5,000 given repeated offenses. Since the captain's name was not listed on the license, individuals on a boarded boat could switch captains, particularly if the actual captain had previous violations, thus allowing the captain and crew to continue to fish. More recently, guidelines were set for gillnet fishers. They are required to have purchased a license between May 1, 1990 and April 30, 1995 in order to qualify for a new license. In the case of the new requirements for shrimp license, this change was enacted to generate revenue and for the increased gillnet restrictions, this change was made because of the recent ban of gillnet fishing in Florida.

In Louisiana, commercial license requirements for shrimp, crab, fish and to work a gillnet were initiated in 1932 and for oysters as early as 1910. These were first initiated to generate a source of revenue for the state, to document participation in each fishery and to gather information on specific fishermen. The major impacts have been increased revenue and better records of participation rates in each fishery.

Most recently, the Louisiana Marine Resources Conservation Act of 1995 (LMRCA) placed a series of restrictions on the gillnet fishery. To qualify for a license a fishermen must provide valid documentation that they were licensed for two of the following years 1993, 1994,

and/or 1995. In addition, 50 percent or more of the applicant's income had to be derived from fishing within two of the last three years. The law also restricts the length of the net. Finally, the LMRCA established the Commercial Fisherman's Economic Assistance Fund which will provide financial aid to fishermen.

In Texas, the shrimp licensing system has been in place for 36 years, and for crab 62 years. These were mainly established as a means to regulate the state's fisheries as well as for the generation of revenue. The major changes in recent years to Texas' commercial licensing system was in 1993-94 when a commercial oyster boat captain's license was added and individual licensing of shrimp crews were eliminated. A second change was implemented for the 1995-96 season. Shrimp boat captains are now required to have licenses. These changes were made in the licensing system to simplify the licensing process, especially in the case of shrimp boat crews who are no longer required to be licensed. These two changes have generally been received positively by the commercial sector. Commercial netting of saltwater fish has been outlawed since 1988. According to Harrison (1996), Texas' gillnet laws have served as an example for the other Gulf states in their considerations of regulating gillnets.

3. Brief History of Recreational Licensing Sector

The general recreational license for snook, lobster, guides, charter, head boat and pier licenses in Florida have been in place for 8 years. These were developed for research, enforcement needs and a demand from the recreational sector for a dedicated revenue to fund management.

Changes to the recreational fishery include the establishment of a recreational shrimping license (1980) and a required hook and line licenses in 1992. Gillnets were licensed in 1986. The major reasons for the development of the recreational licensing were for the generation of revenue and to identify the user-groups of the fisheries.

A recreational license system was created in Mississippi to monitor the size and poundage of fish caught. There have not been any major changes to this component of the state's licensing system in recent time.

Recreational licensing in Louisiana has been in place since 1940. The major changes have been the addition of the turkey stamp, handicap ATV permits and nonconsumptive user stamp. These were initiated in 1995.

In Texas, the fresh water license has been in place for 68 years and the saltwater license has been around for 38 years. These were instituted for customer information and again, as a way to generate revenue for the state. In terms of the recent changes to the recreational sector, in 1994-95 a tarpon tag and a red drum tag were added. For 1995-96, the state began requiring new senior citizens to purchase discounted fishing licenses (those who turned 65 after September 1, 1995). Changes were made because of a public demand for the harvesting of large tarpon (80 inches or longer) and biological evidence documenting that availability had increased. These changes have served to generate more revenue and the public has been satisfied, generally.

Part 6: Effectiveness of Licensing System as a Research Tool

Florida's licensing system does allow for a demographic characterization of its licensees, that is, age, sex, address and telephone number. A 10 percent sample of all licenses is maintained in a data bank for use in surveys. Florida is not able to monitor the historical effort of an individual.

In Alabama, the licensing system also allows for a demographic characterization of licensees as well as the potential for monitoring historical participation of an individual. Such data could provide a sampling frame for special studies of those in the commercial sector and some aspects of the recreational component. Interestingly, data on the largest component, the hook and line group, are not computerized.

In Louisiana, the Department of Wildlife and Fisheries has demographic information on its licensees by Parish. They also able to monitor the historical participation of a licensee by the number of licenses the individual has purchased over-time.

In both Mississippi and Texas, the licensing system also allows for a demographic characterization of a licensee (name, address, date of birth). Random samples can be selected from the computer data base of licensees for special studies as well as monitor an individual's historical participation can be monitored.

Part 7: Effectiveness of Licensing System as a Regulatory Tool

In Florida, the Marine Fisheries Commission is able to indirectly monitor the effects that new regulations may have on a targeted species through research and stock assessments funded by license fees. They are also able to monitor the effects that new regulations have on fishing effort by surveying anglers in regard to the number of trips taken and species targeted.

The Alabama Marine Resources Division is not able to monitor the effects of new regulations on targeted fisheries because the data is not computerized. However, they can qualitatively monitor the effects of new regulations on fishing effort by the number of licenses sold.

In Mississippi, the Department of Marine Resources is able to monitor effects of new regulations on the targeted fishery as well on fishing effort, but only through the number of licenses sold.

For Louisiana, it difficult for the Wildlife and Fisheries Commission to monitor the effects of new regulations on the target fishery and on fishing effort because the regulations frequently change.

Texas is able to monitor the effects that new regulations may have on the targeted fishery as well as on fishing effort through surveys with license holders.

Part 8: Compliance and Enforcement

Residents of Florida are not required to have a license to fish from shore whereas non-residents are. This provision is almost impossible to enforce. The dollar range of fines is from $50-$500. The illegal use of gillnets in mullet, pompano and Spanish mackerel fisheries presents the most problems for the Florida's enforcement agency. The range of fines is from 0-$5,000. The structure of fines in Florida is not set to effectively deter violation of the state's licensing policy. The average number of recreational violations per month is 148 and for the commercial sector the average number of violations per month is 16.

In Alabama, the large size of the hook and line recreational sector presents the most problems with compliance. The gillnet fishery presents the most problems with enforcement. The major impediment for compliance with Alabama's licensing policy is adequate enforcement. The dollar range of fines for both sectors is $25-$2,000. In the case of the recreational fishery, if an individual is caught selling a game fish, in addition to the fine s/he can spend up to 30 days in jail and lose her/his vehicle. Recent laws do effectively deter violations of the state's licensing policy, in particular, the gillnet fishery where violators are given points. After so many points, individuals lose their gillnet license forever. Oyster fishermen have the most violations related to over sacking, not tagging or culling their catch properly; the second most problematic area is the gillnet fishery. There are around 20 commercial violations per month and 30 recreational per month.

In Mississippi, the gillnet fishery presents the most problems for compliance and enforcement. Most violations occur in rivers where mullet fishing is illegal. The dollar range of fines for the commercial sector is $100-$500 dollars and may go as high as $3,000 for a second or third offense. For the recreational sector the fines range from $35-$100. The fines do effectively deter violation of the state's licensing policy. The average number of violations for the commercial sector is 18 and for the recreational sector it is 12.

In Louisiana, there has been confusion among gillnetters as well as legal challenges regarding the gillnet laws. Finfish presents the most problems in terms of compliance with Louisiana's laws. Most violations stem from misunderstanding of the law.

In Texas, the recreational sector poses the most problems in terms of compliance with regulations. The commercial sector presents the most problems for enforcement. This is due to the large number of fishing hours, the volume of the harvest and money limitations for enforcement. The major issue for compliance in the commercial sector surrounds fishermen who claim to have been fishing in the EEZ when they have actually been fishing in Texas state waters. The structure of fines in Texas range from $25-$500 for both sectors and according to state officials, effectively deter violation of the state's fishing regulations. There are around 160 commercial violations per month and 1135 recreational violations per month.

Part 9: Fee Structure

In Florida, fees are established by the legislature and are used for research, enforcement, management and environmental education. In Alabama, fees are set by the state legislature based on recommendations from the Alabama Marine Resources Division and user groups. All fees are used for management and enforcement of the state's marine resources. Fees are established by a seven member Commission in Mississippi and go into a general fund. For Louisiana, the fee structure is established by the legislature and are used for fisheries research, management, enforcement and administration costs. In Texas, there is a statutory minimum for both the recreational and commercial sector with the Commission able to set higher fees by way of regulation or rule changes. The fees are strictly dedicated to fishing and administrative support of fishing.

Part 10: Problems with Current Licensing System

In Florida there are several problems with the state's licensing system. For the commercial sector, license fees are too low, fines for violation are too low and it is difficult to enforce the state's marine regulatory policy. In the recreational sector, there is resident versus non-resident distinction for fishing from shore which creates problems for both compliance and enforcement. In addition, the fines for violation of recreational laws are also thought to be too low to act as a deterrent.

In Alabama, the major problem they are now facing is getting all the recreational licenses on the computer.

For Mississippi, the major problem the state is facing is with the gillnet fishery. Restrictions are being considered. In addition, there are various administrative problems relating to computerization of records.

The major problem in Louisiana is a general confusion regarding the large variety of licenses available. In addition, there are a variety of problems for both the recreational and commercial sector. These include the fee structure, fines for license violations, rates of compliance to the licensing policy, problems related to enforcement and both the effectiveness of the licensing system as a research and regulatory tool.

In Texas, most of the problems are related to the administrative aspects of the licensing system and include availability and timeliness of data and compliance rates. These will be solved by a new Point-of-Sale system which will be operational by the summer of 1996.

Section 11: Discussion and Summary

In this report, we have documented that the licensing systems in place for the Gulf states exhibit a good deal of variation for both the commercial and recreational sectors. The impetus for states to manage their marine resources are certainly multiple and vary from the generation of revenues to support management costs to concerns over the numbers of those fishing, and at what

levels effort occurs. With regard to understanding effort, the states employ both creel surveys to monitor recreational activities, and sample fish house activity to understand levels of commercial harvesting. Much of this information is done either in conjunction with NMFS or in addition to it. A leading assumption is that changes in regulations effecting the number of those fishing and/or levels of effort will be reflected in survey and enumerated data from fish houses.

The assumption of a link between regulations and control of effort is in many cases flawed. It is difficult to estimate the number of fishermen actually involved in a fishery or the level of their activity based on the fact that they hold a license. Many fishermen, for example, may hold a crab or oyster license, but may never use it. They may do this as an emergency alternative should their primary fishing activity be disrupted. Further, fishermen may harvest a species in one state and land it in another. Enumerators at the dock may consistently fail to distinguish harvest location from landing site. In short, licensing practices are inherently flawed in generating information about fishing effort. In fact, recent attempts to negotiate reasonable alternatives to an all out ban of the use of gillnets in Gulf state waters has consistently been hampered by a lack of data on who the participants are, what species are being targeted, and the levels of effort being exerted.

The recent events surrounding the use of gillnets - banning them in Florida and restricting their use in other states- has been truly unique in the sense that in no instance were any of the species being harvested threatened with-over fishing. The motivation to ban or restrict their use was purely political in nature. In the case of the Florida net ban the conflict existed between conservation groups and fishermen, and in Alabama between conservation groups (Alabama Wildlife Federation) and recreational fishermen (GCCA) siding with each other in opposition to gillnet fishermen.

While traditional management strategies seek to control effort and ensure sustainability based on stock assessments, these recent management activities have aimed to either reduced user conflict normally to the detriment of commercial fishermen, or to outlaw the use of a whole category of fishing gear. In short, the consequences of management have always had a social component, but the consequences of these most recent actions are almost entirely social in nature.

Of particular consequence is the recent and by necessity rapid formation of political action groups consisting of fishermen and frequently their wives. Where wives are active, they often play leadership roles. More and more, those involved in these organizations are beginning to realize that their ability to persist as fishermen rests not so much on traditional management strategies driven by biology, but on their own ability to understand and become active in the political processes which govern them. This by nature involves on the part of fishermen the coherent formulation of shared demands, along with the resources and political skills to see them implemented. Already, Gulf Coast fishermen are beginning to see the results of their collective actions. Certainly, the way in which policy has been formulated and implemented in the past is not likely to continue without participation from fishermen.

Part 12: Ethnographic Dimensions of State Fisheries Regulations in the Gulf of Mexico and South Atlantic

Mark Moberg

The following represents a survey of fishermen's responses to licensing and regulatory policies affecting inshore fisheries in Florida, Alabama, Mississippi, Louisiana, and Texas. In most cases, those individuals interviewed were involved in some way in net fisheries in these states, as net fishing has come under the most intense regulatory scrutiny of any Gulf of Mexico fishery. A few fishermen involved in oystering were interviewed in Louisiana and Mississippi. Overall, participants in the oyster fishery, which has one of the longest histories of state regulation among the region's fisheries, were the most likely to regard the regulatory process as an equitable one. All believed that their input, together with that of state health and fisheries scientists, had a major role in regulatory decision-making. Yet, they also expressed concern about the growing tendency for third parties (particularly recreational fishermen) to become involved in fisheries regulations that affect them.

The "ethnographic component" of this research involved interviews with Mark Taylor, former president of the Organized Fishermen of Florida and currently with the Florida Department of Labor; Ben Harvard and Pete Barber of the Alabama Seafood Association; Jean Williams, president, and nine other members of the organization Save America's Seafood Industry in Pascagoula; Eli Ross, a gill net fisherman in Biloxi; Donnie Kennaire, president of the Plaquemines Oyster Association; Benny Miller, president of the Louisiana Seafood Management Council; Mark Boudreaux of the Organization of Louisiana Fishermen; Wilma Anderson of the Texas Shrimp Association; and Richard Moore, a shrimper from Dickinson, Texas.

Florida

In November, 1994, 72% of the Florida voters participating in that year's elections supported a constitutional amendment banning all commercial net fishing (other than cast nets) in Florida waters. Before the 1995 enactment of the amendment, an estimated 6,500 net fishing operations were found in Florida. Between one third and one half of these were full-time operations, the other fishermen being part-timers who supplemented their wages with net fishing. Prior to the net ban, the fishery had been regulated primarily by the Florida Marine Fisheries Commission, which consists of seven appointed members.

Commercial net fishermen had some input into fisheries regulations through the Organized Fishermen of Florida (OFF) and Southeastern Fisheries Association (which primarily represents dealers), both of which lobbied the Commission on behalf of the industry. Throughout the 1980s, both organizations were able to keep up with the regulatory process by sending members and officers to public hearings, learning in advance of commission proposals, polling members, and devising alternatives and compromises to commission proposals. As the fishery became increasingly regulated by the 1990s, however, the organizations lost some of their effectiveness because of the increasing pace and density of regulatory proposals. Fishermen were unable to

take time off to attend hearings and even the organizations' officers found the increasingly complex regulations that were being proposed difficult to understand.

Although fishermen had some degree of influence over the commission, they were denied seats on the commission itself. The seven members appointed to the commission were usually professionals in land-based occupations but who had strong interests in recreational fishing. Members of recreational groups (the Florida Conservation Association and Florida League of Anglers) were frequent participants at public hearings. At one hearing, according to Mark Taylor, the president of the F.C.A. docked his sport fishing boat outside the building where the meeting was being held, lobbied heavily in the meeting on behalf of sport fishing interests, and after the meeting invited the head of the commission on a fishing trip. The Organized Fishermen of Florida protested both to the legislature and the media that such relationships between the commissioners and the recreational sector were an unacceptable conflict of interest. The legislature rejected a bill that would have granted commercial fishermen seats on the commission. Opponents of the measure argued that for commercial fishermen to sit on a board that regulates commercial fisheries would itself amount to a conflict of interest.

Mark Taylor of the Department of Labor estimates that of the 3,000 or so full-time fishermen affected by the net ban, about 25% continue to support themselves by fishing. Virtually all of the older fishermen have stopped fishing, as have part-timers. Most of those who remain in some fishery have tried to shift into blue and stone crabbing, although this possibility was foreclosed for those not already holding licenses for these fisheries (see below). The Department of Labor has transferred about 200 fishermen into clam aquaculture at three sites around the state. Virtually none of the fishermen displaced by the net ban had sufficient capital to go into offshore operations. Because the vessels that they used for inshore waters were far too small for operations outside the 10 mile EEZ boundary off the Florida coast, the only Florida-based net fishermen who remain are big boat owners: "The small guys are finished as far as net fishing goes." Nor have fishermen been able to establish themselves in other states. Fearing an exodus of Florida fishermen, other Gulf and Atlantic states raised non-resident license fees or imposed limited entry or moratorium schemes.

Most of the fishermen forced out by the net ban have yet to be fully reconciled to it. Most collected unemployment for six months, and then lived off of the checks from the state's net buy-back program. For most fishermen, their age, specialized skills, and limited education severely restrict their employment options. One of the benefits that displaced fishermen were able to obtain from the state was occupational retraining. Wives and other family members also were eligible for retraining if fishermen could demonstrate that they had formerly been part of a family business. Taylor's daughter was able to attend a dental hygienist program; he is planning (with little apparent enthusiasm) to attend a truck-driving school when his temporary position with the Department of Labor expires in April, 1996.

A second benefit that the legislature made available was eligibility for unemployment insurance (at least for captains--crews were eligible only if captains paid their unemployment insurance premiums). Finally, the state inaugurated a net buy-back program, in which fishermen were able to sell their nets to the state according to their past recorded landings. For 600 yards of

shallow net, up to $500 was paid per net; for a comparably-sized deep net, up to $1,000 was paid, and for a purse seine, up to $3,500 was paid. These payments amounted to about a fourth of the value of the gear, but in the absence of other buyers the buy-back payments were all that fishermen could expect to salvage from their businesses. Since boats for gillnetting generally couldn't be used for other purposes, they are presently tied up and awaiting buyers. Fishermen were unsuccessful in lobbying the state for loans to establish small businesses. Eight fishermen (including Taylor) were hired by the state Department of Labor through April 30, 1996, to assist fishermen affected by the ban.

Although several other fisheries remain open in Florida waters, such as long-lining and crabbing, they are subject to increasing regulatory pressure. Fishermen in the Keys are facing a Marine Sanctuary designation that would virtually shut down all commercial fishing operations. Following the net ban, the state imposed a moratorium on new crabbing licenses. This amounted to a limited entry scheme, where eligibility for license renewal was based on a minimum level of previous landings. The goal was to prevent a massive transfer of net fishermen to crabbing, and an ensuing depletion of the resource. Even those fishermen who held secure licenses for other fisheries were hurt by the net ban. The number of support facilities and services for fishing boats has declined as land-based businesses that served fishermen have shut down. The crab and long-line fisheries have been hurt as well by the fact that bait shrimp now cost vastly more in Florida than previously, as local fishermen cannot supply fishermen with shrimp. Taylor points out that attempts to regulate fisheries individually overlook the complex interrelationships between them, as well as the fact that many people participate in more than one fishery throughout the year.

Fishermens' organizations continue to fight the net ban in the court system, but Taylor is pessimistic about the prospects of reversing it. OFF has filed suit against the Florida Marine Fisheries Commission for violation of due process in depriving fishermen of their property and livelihood. It has also filed suit against sixteen television stations in Florida for running what it alleges to be inaccurate ads by the FCA (which contain footage of by-catch taken aboard the Georgia Bulldog TED research vessel, and attributing the scene to a Florida net-fishing operation). Finally, it has filed suit against the Department of Labor for short payments in the net buy-back. About 50% of those selling their nets back to the state received less payment than what they had been previously promised. The state contends that this is because the fund for buy-backs is depleted, although Taylor notes that millions still remain in the fund.

Taylor reports that most fishermen are still incredulous and "in denial" about the amendment banning net fishing. Working with those who have been displaced by the ban, he has seen abundant evidence of its emotional consequences:

Fishermen don't like to admit it, because they're a prideful grou p. They never want to ask for help. But within the families you hear about it. The guy who went crazy and just left his family and disappeared somewhere. Another one who's drinking himself to death. Or the guy who blows his brains out. It's very hard to get over this anger. It will never heal...even ten years from now, if an FCA guy says something to me the wrong way, I'm likely to let him have it. It was a terrible injustice what they did to all these families.

Alabama

Following the vote to ban net fishing in Florida, the state of Alabama enacted new restrictions on gillnetting. To an extent, these restrictions are the outcome of similar pressures on the commercial fishery by recreational interests. State officials were concerned about the possibility of an influx of Florida fishermen displaced by the net ban there. In December, 1994, the Gulf Coast Conservation Association and Alabama Wildlife Federation proposed a total net ban in state waters. They later modified this proposal to one requiring net fishermen to operate 1,800 feet from the shoreline of Mobile Bay and one half mile from the coastal beaches. In practice, fishermen complained, these proposals would still close off their access to most areas that they previously fished with gillnets. Fishermen responded to the proposals with public demonstrations at Dauphin Island, Bayou La Batre, and Mobile. There followed three months of negotiation, mediated by the Alabama Marine Resources Advisory Board, between the GCCA/Alabama Wildlife Federation and commercial fishing representatives from the Alabama Seafood Association.

Under a compromise agreement announced on March 31, 1995, spotted sea trout and red drum were incorporated into a fine system where points were taken from commercial fishermen possessing these game fish. Repeated possession of these fish would make commercial fishermen ineligible for renewal of gill net licenses. Under the new law, Alabama also restricted gillnets to no more than 2,400 feet in length. Finally, the state put in place a limited entry program, the intent of which is to restrict the access of part-time fishermen to the net fishery. Presently, to qualify for a gill net license, an applicant must have purchased a license for at least two years between 1989 and 1993. In addition, at least 50 percent of an applicant's gross income on an Alabama tax return for two years between 1989 and 1993 must have come from the capture and sale of seafood. The state imposed higher license fees on non-residents, and instituted a $500 mackerel/mullet permit, which must be purchased in addition to the $300 resident gill net license. The rationale for these fee increases was to discourage out-of-state and part-time participation in the fishery, as most part-time fishers target mackerel and mullet.

According to Ben Harvard, a gillnetter in Grand Bay, Alabama, the state's fishermen have their primary input into inshore regulations through industry organizations, such as the Alabama Seafood Association. The organization is made up of seafood dealers and "bonafide" (i.e. full-time) fishermen from all of the state's commercial fisheries. He describes the 1995 gillnet restrictions and licensing changes as a compromise between an "open" fishery and sports fishing interests that wanted to shut down the fishery altogether. Commercial fishermen, he notes, are coming under increasing pressure by recreational groups, and are being forced to devise compromise measures in order to stay in business at all: "Because of the GCCA and all its lobbying, we're being nibbled to death. Every regulation takes away more of our rights and more of our area. They're always proposing new regulations, so we're sacrificing our work just to defend ourselves at public hearings. Compromise is something that's supposed to involve both parties, but it seems to me that it's only the fishermen who are giving up anything."

Ultimately, Harvard claims, it is "the balance of political forces" that determines what

policies are written into law, "and we're on the losing side where politics is concerned." While the state and conservation organizations call for regulation of net fisheries to manage and sustain fish stocks, Harvard claims that "there is no biological evidence that actually shows any need to stop net fishing. We know a lot more about the resource than the GCCA does. We have to. I come from three generations of fishermen in my family. I'm still hoping to pass on my business to my son. Well, how do you think we've been able to have a fishery this long if we didn't take care of it?"

Despite misgivings about the regulatory process, Harvard states that the limited entry scheme has been beneficial for the livelihood of full-time fishermen such as himself. In 1995, he derived 100% of his income from net fishing for mullet, Spanish mackerel, pompano, and bait. He has seen a substantial reduction in participation in the fishery, and claims that the number of gill net licenses sold in Alabama diminished from about 500 in 1995 to 150 in 1996. This attrition has been achieved at the cost of out-of-state, weekend, and part-time operators. Their presence will not be missed, for he asserts that they have no place in the commercial fishery:

I t's the part-timers who don't observe the rules of the road. They're the ones who drag too close into shore, and up around the piers on Dauphin Island. They fish right around the recreational guys and don't care whether they both er anybody or give the industry a bad name. Your sports fisherman sees that and that's the image that he has of commercial fishermen. But I say your part-timer's not a commercial fisherman at all. He doesn't have a vested interest in the fishery. When we get shut down, he's got his job at Ingall's or wherever to support him. He's not the one who suffers. If anything, I think they ought to increase the income limits [for licensing] to 70 or even 80%.

In one respect, Harvard notes, the move toward restrictions on gillnetting in the Gulf states has curtailed his operations. Ironically, these restrictions are similar to those he supports for Alabama waters. Harvard formerly fished in Louisiana for part of the year, but that state recently raised the price of non-resident net fishing licenses from $400 to $1,900. As in Alabama, the intent of these increases was to discourage participation in the fishery by out-of-state fishermen. "The problem is," Harvard explained, "the fish don't stay in one place. So when Louisiana raised the price of their licenses, it was a hardship for us."

One criticism that he directs toward state licensing requirements is that licenses are issued to captains and do not apply to the crewmembers employed by him. Hence, if he becomes ill or incapacitated, his crewmembers also lose the opportunity to work. Issuing the license to a boat rather than a captain would not add any new operations to the fishery, but it would enable crewmembers to continue working when the captain cannot. Finally, he also feels that eligibility for licenses in a limited entry scheme should be inheritable within families and transferable from captain to crewmember. Presently, with eligibility for licenses limited to those who already hold them, there is virtually no possibility for crewmembers to advance to the status of licensed captain. "These kinds of rules that we have here in Alabama, at least they let the full-time fisherman continue to work. But unless they do something to make the licenses transferable, we're going to be the last generation on the water."

Mississippi

Reacting to the net ban in Florida and restrictions in other states, the Mississippi Commission on Marine Resources passed "emergency" regulations in August, 1995, that limited the issuance of gillnet licenses for one year. According to Commission members, concern about an influx of non-resident gillnet fishermen prompted the decision. Some conservation groups, such as the Coastal Conservation Association of Mississippi (CCAM), have argued that stocks are overfished and that the state should impose tighter restrictions.

The 1995 restrictions were negotiated after the defeat of several bills in the Mississippi legislature that would have completely banned gillnetting in state waters. Members of the Pascagoula-based organization, Save America's Seafood Industry (SASI), which represents a variety of part- and full-time fishermen, lobbied heavily for the defeat of the gillnet bans. SASI also took part in the negotiations leading to the gillnet restrictions.

Jean Williams, president of SASI, claimed that the Bureau of Marine Resources, to which the Commission reports, acknowledges that there was no scientific basis for the final net fishing regulations. Rather, the Commissioners tried to resolve a looming conflict over the allocation of marine resources by separating commercial fishermen from other users and restricting the times and areas in which net fishermen could operate. "At three separate public hearings, we had CCA people all over us calling for a total ban. Most of us had never seen these people before; it was clear most of them were not from around here," she noted. "We tried to find a compromise that would at least let us stay in business. But, as usual, it was the fishermen who did all the compromising."

The regulations passed in 1995 amount to a moratorium on the issuance of licenses to fishermen seeking access to Mississippi waters for the first time. Licenses would be assigned only to those individuals or firms that held net licenses during any one year between May, 1990 and April, 1995. Fishermen claim that the regulations' restrictions on their operations are designed to accommodate non-commercial users of state waters, such as sport fishermen, beachfront residents, and the tourism industry. Net fishermen are now prohibited from fishing between 6 a.m. on Saturdays until 6 p.m. on Sundays, as well as holidays -- times when other groups are most likely to be using beachfront and inshore waters. In addition, they are required to operate at least a half mile from the beach in the daytime and 1,500' at night in the central part of the coast, where highway 90 runs adjacent to the beach.

Referring to the areas from which they are now prohibited from operating, third generation fisherman Eli Ross of Biloxi observed, "That's where you've got all your jet skiers and speedboats, so we don't catch fish during the day there any way. But what hurt us is that we can't work on weekends no more -- just so the tourists and sportsmen don't have to see us ugly fishermen. What I don't get is how can they tell us we can't work on weekends? We don't tell them they can't sport fish on weekdays." The new time restrictions apply as well to inshore shrimp fishermen, who in addition are required to stay one half mile off the beach at all times.

Notwithstanding these restrictions, conservation groups in Mississippi continue to promote legislation and regulations that would further reduce the number of gillnetters in state waters. State bill 1401, a measure introduced into the Mississippi legislature that would have imposed a limited entry licensing program based on income restrictions, was defeated on March 12. Significantly, SASI lobbied against the bill and opposes any such income restrictions for the issuance of licenses. In contrast to organizations of full-time fishermen in other states, such as the Alabama Seafood Association, SASI is heavily comprised of part-time fishermen whose continued participation in the fishery would be threatened under a limited entry scheme. SASI's ability to mobilize part-time fishermen, who, according to Jean Williams, outnumber full-time gillnetters in Mississippi waters, may account for its success in lobbying against limited entry legislation.

Among nine SASI members surveyed, seven opposed licensing policies that would restrict the activities of part-time fishermen. Of these, six were themselves part-time fishermen (three gill-netters, two shrimpers, and one oyster fisherman) and one was a full-time gillnetter. The two individuals who favored limited entry schemes were both full-time gillnetters who derived all of their income from fishing. In response to the question of whether part-time fishermen should be licensed differently from full-timers, one of the SASI members commented, "No. They need this to support their families. Many part time fishermen have been forced out by unfounded laws." In contrast, Eli Ross, a full-time fishermen, stated in a telephone interview that "it's the part-time pirates that give the commercial fisherman a bad name. They're the ones operating in the back bays and up around the sport fishing areas." Ross argued in favor of limited entry schemes designed to restrict fishing to full-time participants: "What these conservation groups are doing, trying to ban gill netting, isn't going to help anything. They'll just end up driving the legitimate fishermen out of business, and the part-timers will stay at it."

On March 26, the Mississippi Commission on Marine Resources will decide on a new licensing procedure to supplant the moratorium currently in effect. The procedure has been strongly promoted by sportfishing groups and is reportedly favored by those members of the Commission with ties to the recreational sector. Under the proposed regulations, gillnet licenses would be limited to those individuals who purchased licenses in each year between 1993 and 1995. In addition, it would introduce income requirements designed to phase out part-time participation in net fisheries. To qualify for a license in 1997, applicants would have to demonstrate that 30% of their 1996 incomes derived from fishing. This requirement would increase to 40% in the following year, and 50% thereafter.

A board member of SASI felt that the "real" intent of the new policies was to eliminate net fishing completely, although the proposal had the "appearance" of a compromise that would enable some gillnetters to remain in the fishery. She observed that the proposed laws would impose seasonal closures on net fisheries for all but 145 days of the year: "Now tell me something. Who is going to be able to fish a third of the year to make half of their annual income? The income restrictions, combined with the season closures, can only mean one thing: by 1999 nobody will qualify for a gill net license."

Surveyed members of SASI unanimously felt that current licensing procedures were unfair and entailed undue interference in the regulatory process by recreational fishermen. One SASI

member also commented that attempts to regulate one fishery in isolation usually have unanticipated effects on others: "Now answer me this. You ban the net fisherman from Mississippi waters, even if he can go into something like long-lining, where is he going to buy bait? It's the net fisherman who supplies the other fisheries. Also, if you stop fishing for one species, what will that do to the other fisheries? I've seen what happens when we have more redfish and flounder, then the crab population crashes. You ban the net fisherman, you might as well close down the long-liner and the crabber, too. This is what comes of having people who don't know anything about fisheries making fisheries policy."

Another fisherman, who is a full-time oysterman, noted that even oyster and crab fishing, whose participants have traditionally had a direct role in formulating state regulations, are finding that policies are increasingly affected by "outside interests...The GCCA is going after oyster dredging because they claim it dirties up the water. They don't like crab traps because their [fishing] tackle gets caught in them. It won't be long before we're in the same boat as the net fishermen." Finally, asked what he would recommend to improve current licensing procedures, one gillnetter responded, "Base all fisheries management on scientifically proven facts. No hearsay that cannot be substantiated should be entered into policy, specifically propaganda distributed by the CCA, GCCA, or any special interest group."

Louisiana

In 1995, the GCCA and Louisiana Association of Coast Anglers promoted a gillnet ban to prevent overfishing of marine stocks. Commercial fishermen responded with a proposal for a five year moratorium on the issuance of new gillnet licenses, which would prevent Florida and other out-of-state gillnetters from entering Louisiana waters. Conservation organizations opposed the moratorium, as they anticipated that an influx of non-resident fishermen would force the state to adopt more stringent measures, including an outright ban on all net fishing.
Instead, the Louisiana legislature enacted gillnet restrictions that amount to a limited entry program.

Fisheries policies are promulgated by the Louisiana Wildlife and Fisheries Commission, a seven member panel appointed by the governor, although policies generally originate as laws passed by the legislature. Benny Miller, president of the Louisiana Seafood Management Council, contends that since the president of Louisiana GCCA was appointed as the new state secretary of Wildlife and Fisheries, state fisheries regulation has become "openly biased" toward recreational fishermen's interests. He claims that such biases are reflected in the way in which the commissioners preside over public hearings concerning new fisheries regulations. At the hearings that preceded the introduction gill net restrictions, "the supporters had hours -- literally -- to make their case. Commercial fishermen got about 15 minutes at the very end. Now one of the things I pointed out is that all the scientific evidence shows that the fish stocks that we rely on are in good shape. So I asked the chair of the commission, isn't it state law that fisheries policies should be based on biological and scientific data? And the guy actually said, we can base our policies on whatever we think is best for the people of the state. The whole public hearing input process is a sham. They knew what they were going to do and they weren't about to let anybody stop them."

Under the Lousiana Marine Resources Conservation Act (LMRCA) of 1995, applicants for a gill net license must prove that they held a commercial net license during any two years of 1993, 1994, or 1995. Additionally, for at least two of the same years, applicants must be able to show that at least 50% of their income derived from the capture and sale of seafood. Among the restrictions entailed in the bill were prohibitions on weekend gill net fishing and a ban on night fishing. The law also established the Commercial Fishermen's Economic Assistance Fund, which uses money raised from license fees to assist fishermen negatively affected by the LMRCA.

According to Miller, the requirements of the law have forced out of the fishery many gill netters who would otherwise qualify for a license. To qualify for a 1996 license, for example, net fishermen had to demonstrate their eligibility before December 31, 1995. Yet to prove their eligibility for a license they had to produce an income tax return indicating that they derived at least half of their income from fishing: "Now you have to produce two tax returns out of 93, 94, and 95. Let's say you had more than half your income from fishing in 94 and 95, but not 93. If you have to apply before the end of 95 for a 96 license, how are you going to produce a 95 tax return when the state hasn't even mailed out any tax forms yet?" Of 1,050 gill netters operating in state waters in 1995, Miller estimates that fewer than half were relicensed in 1996. "Most of the ones who are out are the part-time guys, but there were plenty -- I'd guess, 15-20% of the total -- who got caught in the tax return requirement."

The Lousiana Seafood Management Council (LSMC), which represents commercial interests, challenged the gill net restrictions in court and won a temporary restraining order postponing enforcement until August 31, 1995. The restrictions subsequently went into effect, but the LSMC continues to seek a judgement on the constitutionality of the law. The organization claims that the law has unequally allocated marine resources between commercial and recreational fishing interests without scientific evidence that such restrictions were necessary for management of fish stocks. Further, LSMC alleges a lack of due process in the taking of property and livelihoods, as equipment used in gillnetting has been made worthless under the law.

While the state instituted a net buy back program, the LSMC charges that it has failed to fund it adequately. The buyback program was to be funded with a $3.00 increase in the price of a state saltwater stamp for recreational fishing licenses, although of this amount two thirds was to be allocated to the purchase of nets and one third to enforcement of net restrictions. Those who surrender their nets under the program must pledge never to work in net fishing again. To be eligible, fishermen were required to commit themselves to the buyback in December, 1995, but will not be informed until June, 1996, of the amount they will be paid for the nets. Miller notes that few fishermen accepted the terms of this buy back because of their uncertainty about the state's offer.

Anticipating that many commercial net fishermen would attempt to shift to crabbing following the gillnet restrictions, the state imposed a moratorium on the issuance of new crab fishing licenses in 1995. Existing crab fishermen generally supported the move, Miller notes. He argues that the Fish and Wildlife Department's fear of a large-scale influx into crab fishing was generally unfounded. Few net fishermen have the resources to purchase several hundred traps at

$12-13 each, particularly after the passage of the gill net restrictions made it difficult for them to dispose of their existing gear on the market.

In contrast to net fishermen, oystermen in Louisiana generally perceive their relationship with state licensing and regulatory agencies as a "partnership," according to the president of the Plaquemines Oyster Association. Oystermen accompany fisheries biologists and health department officials in periodic inspections of oystering grounds. The data gathered during such inspections are used by the Wildlife and Fisheries Commission to establish season openings and closures. Oyster fishermen realize that a single well-publicized instance of illness or death from contaminated shellfish can ruin their livelihood for months or even years. Emblematic of such concerns is the state's introduction of a supplemental "harvester's license" at the request of Louisiana oyster fishermen. The $100 license must be held by the captain of every boat participating in the oyster fishery, and is supplemental to the commercial oyster fishing license. Danny Kennaire claims that oystermen "imposed this on ourselves" to fund state Health Department seafood inspections and an oyster task force to apprehend poachers. While oyster fishermen are generally "satisfied" with their ability to provide input into licensing and regulatory procedures, Kennaire notes that most regard the Wildlife and Fisheries Commission as ineffectual because its members are political appointees. "We're always having to go to Baton Rouge to educate these guys. Most of them don't know anything about commercial fishing, but they do know not to mess with expert recommendations about closures and openings. So they leave us and the Health Department people to run the fishery in the safest way possible."

Texas

In 1981, Texas became the first state on the Gulf of Mexico to impose a ban on gillnetting, initially to reverse a decline in the state's red drum and sea trout populations. Seven years later the Texas Parks and Wildlife Department extended the ban to include strike nets and trammel nets as well. Both measures were imposed over the objections of the commercial fishing organization Professionally Involved Seafood Commercial Enterprises (PISCES). The organization's founder, Richard Moore, claimed that recreational fishermen associated with the Houston-based Coast Conservation Association (CCA.) were the primary advocates and beneficiaries of the ban.

Shrimping is the only remaining legal net fishery in Texas waters. According to Moore, who is now a full-time shrimp captain, that fishery is being regulated "out of existence" by an ever-expanding set of restrictions. In 1990, the TPWD restricted shrimp "nursery areas" from trawling and imposed a ban on night time fishing. In 1993, trawl times for the bait shrimp season (April to August 15) were further reduced to daytime hours between 30 minutes before sunrise to 2 p.m. "Without any scientific basis for the decision, they took away two thirds of our dragging time just like that," Moore stated.

Since June, 1995, the inshore shrimp fishery has been under a moratorium. All shrimp fishermen must hold annual captain's licenses, which are issued by the state for $25. They must also hold bay commercial shrimping and/or bay bait shrimping licenses, but the state has not issued new licenses of either type since the moratorium went into effect. According to Wilma Anderson, 26 fishermen met with TPWD in 1995 to consider a limited entry program. While the

policymakers "invited our opinions, they really didn't want to know what we thought. They already had their minds made up." Moore was among the shrimpers who met with TPWD to assess the moratorium proposal: "We didn't ask for limited entry. We accepted it only as the lesser of two evils. They threatened us with 1 3/4" webbing if we didn't take limited entry. That kind of web would finish us as far as bait shrimping is concerned. So we went in there to get something we could live with."

Under current Texas law, new fishermen may enter the inshore shrimp fishery only by purchasing the license of someone who is leaving the fishery. Further, those seeking to purchase a license must have held a Texas captain's license for at least two years. The moratorium has not been resented among Texas shrimpers, according to Moore, who describes it as "necessary" to prevent over expansion of the inshore fleet by the entry of nonresident fishermen. Following the settlement of Southeast Asian immigrants along the Gulf coast in the early 1980s, Moore states, the Texas fleet expanded to nearly 5,000 boats -- far more than could be economically supported by inshore shrimp stocks. With the advent of TEDs and competition from imported shrimp, the fleet has diminished greatly in size, to about 1,700 at present. Nonetheless, Moore fears that without a moratorium, there could be a repeated influx into the Texas fishery from other states.

While the moratorium is acceptable to most Texas shrimpers, the additional restrictions on their gear and activities that were imposed in 1995 were not. These added provisions include a reduction in net size and the imposition of daily bag limits. Between December 15 and August 15, shrimp boats may only pull 32 foot nets. For the first five of those months, shrimpers may only harvest 200 lbs. of shrimp daily. Between May 15 and July 15, the bag limit is increased to 600 lbs. daily, "but this is really just a gimmick," Moore claims, "since we have to finish by 2 p.m. anyway, it's very seldom that you catch your limit."

Moore's attitudes toward the regulatory and licensing process could probably speak for most of the individuals interviewed in the course of this study:

The regulatory process is all politics. It's about who has the power to def ine issues according to their interests. What we're seeing right now is that the c ommercial fisherman is in the minority in all the Gulf states. We're und erfunde d and outgunned by all the recreational lobbyists and all the so-called conservationists. Ask a fisherman if we have a problem with fish stocks, at least the kind of problem that CCA. is always screaming about. He sees the resource everyday -- he'll tell you we don't have a bycatch or a biological problem. We have a political problem.

PART II: EASTERN SEABOARD STATES
(Results of a Survey)

Douglas Hobbs and David Griffith

Questionnaire for State Licensing Information

State

1. Maine
2. Maine
3. New Hampshire
4. New Jersey
5. New York
6. Delaware ("Your questions are not compatible with Delaware's licensing system").
7. Rhode Island
8. New Jersey

How many different types of commercial licenses does your state offer?

1. 22
2. 21
3. 2 to harvest, 2 to sell (talked with enforcement guy while doing this questionnaire).
4. 30+ (combination of gear, boat, person). No license to sell.
5. 10
6. 17
7. 39 resident and non-resident licenses
8. 19

List the names of the three major fisheries in your state's commercial sector.

1. Lobster, shellfish (clam, oyster, quahog), sea urchin
2. Lobster, sea urchin, clams
3. Lobster, groundfish, shrimp
4. Surf clam, otter trawl (fluke), hard clam/crab
5. Hard clam, lobster, squid
6. Blue crab, weakfish, American shad
7. Lobster, shellfish, finfish
8. Clams (surf and quahoy), blue crab, Summer flounder

What types of gears are most often used in each of your state's commercial fisheries?

	Fishery	Gear Type
1.	Lobster	Trap
	Sea urchin	Dredge, hand, divers
	Shellfish	Divers
2.	Lobster	Conventional trap
	Sea urchin	Drag, dive
	Clams	Hand tool
3.	Lobster	Trap
	Groundfish	Trawl, gillnet
	Shrimp	Trawl

4.	Surf clam	Dredge
	Fluke	Otter trawl
	Crab	Pot/dredge
5.	Hard clam	Rake
	Lobster	Pot
	Squid	Trawl
6.	Crab	Pot/dredge
	Weakfish	Gillnet
	American shad	Gillnet
7.	Lobster	Trap
	Shellfish	Dredge/hand harvest
	Finfish	Trawl/hook-and-line
8.	Clams	Dredges and rakes
	Blue crab	Pots
	Summer flounder	Otter trawl

What are the licensing requirements for commercial vessels in your state?

1. Don't license vessel, just license individual. Do license vessel for sea urchin
2. Licensed through federal government for specific fisheries. Boat must be registered to operate on water or documented federally.
3. Acquire commercial registration for boat through Department of Safety
4. Boat registration/historic participation
5. Generally, New York licenses persons, not vessels. Licenses required for: lobster (resident, non-resident, landing); food fish (resident, non-resident, landing); blue crab (resident, non-resident); shellfish harvester; menhaden purse seine.
6. Proof of ownership
7. Over 5 net tons, Coast Guard documented. Commercial vessel license (fees based on boat length) $20 per linear foot if over 99 feet.
8. New Jersey licenses the gear rather than the vessel. Fishermen using some gear types are required to display their gear ID number on the sides of their vessel.

How many different types of recreational licenses does your state offer?

1. 1 (non-commercial scallop)
2. 1
3. 2
4. 2 (shellfish, crabpot)
5. 0
6. None
7. Non-resident shellfish, lobster (pot - diver)
8. None for saltwater

List the names of the three major fisheries in your state's recreational sector.

1. Striper, bluefish, mackerel
2. Non-commercial scallop, striped bass, bluefish

3. Finfish, clam, oyster, lobster
   (finfish - no license. Smelt, trout, salmon -- freshwater license)
4. Crab, fluke, striped bass
5. Summer flounder, bluefish, Winter flounder
6. Weakfish, Summer flounder, blue crab
7. Lobster, shellfish, finfish
8. Summer flounder, weakfish (black sea bass, tautog, ling), bluefish

What types of gears are most often used in your state's major recreational fisheries?

	Fishery	Gear Type
1.	Striper	Hook-and-line
	Bluefish	Hook-and-line
	Mackerel	Hook-and-line
2.	Non-commercial scallop	Drag/dive
	Striped bass	Rod-reel
	Bluefish	Rod-reel
3.	Finfish	Hook-and-line
	Clam	Hand harvest
	Oyster	Hand harvest
4.	Crab	Pot/hand-line/scoop net
	Fluke	Hook-and-line
	Striped bass	Hook-and-line
5.	Summer flounder	Rod-and-reel
	Bluefish	Rod-and-reel
	Winter flounder	Rod-and-reel
6.	Weakfish	Hook-and-line
	Summer flounder	Hook-and-line
	Crab	Hand line
7.	Lobster	Trap
	Shellfish	Hand harvest (can't use commercial gear)
	Finfish	Hook-and-line
8.	Summer flounder	Rod-and-reel
	Bluefish	Rod-and-reel
	Weakfish	Rod-and-reel

What are the licensing requirements for recreational boats in your state?

1. Federal requirements in large enough. Licensed by Maine fish & game.
2. Boat registration only
3. Same as above *[this answer doesn't make any sense]*
4. Registered with state
5. None
6. None
7. Registered with state 13-foot or larger; under 13-foot if motor is used.
8. Boats must be registered. Cost depends on length of boat.

HISTORICAL OVERVIEW

How many years has your state's commercial licensing system been in place?

1. 50+ years
2. 60+ years
3. 20+ years
4. Varies by license
5. 8 years (for food fish)
6. 12 years
7. 20+ years licensing commercial fishermen. Current goes back to 1987.
8. 48+ years

What were some of the major reasons which led to the development of a commercial licensing system in your state?

1. Know number of people involved, status of fisheries, user conflicts, enforcement of regulations.
2. Funding for law enforcement and research activities
3. For management purposes -- effort, capacity
4. Federal -- ASMFC/MAMFC -- dictating policies
5. Revenue; need for information on nature and magnitude of commercial fishing
6. Overfishing, special interests
7. Count who's fishing / gear, harvest. Information for management purposes.

How has your state's commercial licensing system changed in recent years?

1. 1982 - 7 licenses; 1995 - 22 licenses; 1995 - add for eel
2. Rules, regulations, laws, fees have all changed in last five years. Results have closed to new applicants on sea urchin and lobster fishery.
3. No. Coast netters permit -- no money involved.
4. None in recent years
5. Moratorium on new licenses since July 1995
6. Conch pot, conch dredge in 1995
7. 1992 -- 5 new non-resident landing licenses, several new dealer licenses
8. Purse seining for menhaden for bait only. Permits to take horseshoe crabs, Summer flounder, sturgeon, blue crabs.

How long ago did these changes take place?

2. Within five years
   Sea urchin -- 1993
   Lobster -- 1995
3. Coast netters permit *[I think]* -- 10 years ago
4. Limited entry crab -- 2 years ago
7. Moratorium on all new licenses July 1, 1995 (3 years)

8. Purse seining for bait only -- net reduction -- 5 years
   Horseshoe crab -- 2 years
   Summer flounder -- 3 years
   Sturgeon -- 3 years
   Blue crabs -- 2 years

What were the legislative processes or initiatives which resulted in these changes to your state's commercial licensing sector?

1. Problems/conflicts in lobster fishery. Lobster the BIG fishery
2. Moratoriums established on both fisheries. Specifically with lobster -- apprenticeship program now a part of the law.
3. Agency change
5. 1995 -- legislation to prevent significant new entry to state fisheries.
6. New laws were enacted creating the new licenses.

What other concerns led to changes in your state's commercial licensing system?

1. Environmental change, overfishing/increased effort
2. Decline in fish populations and allow the state to determine participation and fishing concentration and effort.
3. Species driven/effort. Driven -- as species targeted, more effort, agency considers changes
4. Need to reduce effort (crab)
7. Overfishing, preserve the resource, more gear in use
8. Limited entry system for Summer flounder and sturgeon and blue crabs

What has been the impact of these changes on commercial fishers?

1. Limit on licenses has leveled effort
2. Restricted entry at both federal and state levels with consideration to other fisheries as well.
4. Reducing number of crabbers to 1990 levels.
5. Too soon to tell.
6. Limited entry -- frustrated individual who cannot access the fishery.
7. New people can't get a license due to license moratorium.
8. Less flexibility to move between fisheries.

What has been the impact of these changes on recreational fishers?

2. Unknown
5. Too soon to tell.
6. None

Which group of fishers has been affected most by the changes in your state's commercial licensing system?

1. Shellfish/clam -- towns set up own management
2. Sea urchin and lobster -- restricted entry
5. Commercial
6. Commercial fishermen
7. All equally

8. Commercial

How many years has your state's recreational licensing system been in place?
1. 10 years
2. 8 years; non-commercial scallop
3. 20+ years
5. 0
6. N/A
8. Don't have one for fishing. Have a recreational clamming license.

What were some of the major reasons which led to the development of a recreational licensing system in your state?
1. Wanted to regulate scallop divers (recreational), problems with scallop fishery, a lot of tourists.
2. Participation into fishery between recreational and commercial scallop fishermen.
3. For management purposes
5. N/A
6. N/A

How has your state's recreational licensing system changed in recent years?
2. No new licenses added.
3. No

How along ago did these changes take place?

What were the legislative processes or initiatives which resulted in these changes to your state's recreational licensing sector?
2. Conflict between recreational and commercial scallopers.

What other concerns led to changes in your state's recreational licensing system?
2. To determine numbers

What has been the impact of these changes on commercial fishers?
2. None

What has been the impact of these changes on recreational fishers?
2. None. Note: Non-residents are allowed to purchase this license only.
7. No real impact, no limit on number issued

Which group of fishers has been affected most by the changes in your state's commercial licensing system?
2. Sea urchin and lobster
6. Crabbers, gillnetters

EFFECTIVENESS OF LICENSING SYSTEM AS A RESEARCH TOOL

Does your state's licensing system allow for a demographic characterization of its licensees?

1. Yes
2. Yes
3. No
4. Yes
5. No
6. No
7. Yes
8. No

How is this done?

1. Economics, no. Personal data, yes. What you fished for -- comes from license application.
2. Years in fishery, residence, age
4. Information comes from license information and (for specific fisheries) regulations specify particular types of reporting.
7. Information license application

From your state's licensing system, are you able to monitor the historical effort of a licensee?

1. No
2. Yes
3. Yes
4. Yes
5. No
6. Yes
7. No
8. No

How is this done?

1. Type of gear
2. By licenses licensee has purchased over years
3. People report through log book / monthly
4. From number of licenses bought and landings information
6. Monthly reports / annual reports

Does your state's licensing system provide a sampling frame for special studies of licensees?

1. Yes
2. Yes
3. Yes
4. Yes
5. No
6. No
7. Yes

8. Yes

How is this done?

1. Somewhat; information supplied with license application
2. Specific questions to determine licensed activity
3. People report through log book / monthly
4. Information from license application
7. Can be done with information provided on license application.

EFFECTIVENESS OF LICENSING SYSTEM AS A REGULATORY TOOL

From your state's licensing system are you able to monitor the effects new regulations may have on the targeted fishery?

1. No. You can with license limitation
2. Yes. Numbers of licenses sold. In relationship to fishery most likely, no.
3. Yes, through log books
4. No
5. No
6. No
7. Yes, can monitor by which license they purchase
8. No

From your state's licensing system are you able to monitor the effects new regulations may have on fishing effort?

1. No
2. Yes. Example: lobsters -- how many traps does a fisherman fish?
3. Yes
4. Can't say if regulations having any impact because number of licenses fairly constant.
5. No
6. No
7. Yes and No. Can trace number of licenses
8. No

COMPLIANCE AND ENFORCEMENT

In your opinion, which fishery has the most problems with compliance to your state's licensing policy?

1. Clam
3. No pervasive problem
4. 14% of total in violation.
5. Food fish
6. Blue crab

In your opinion, which fishery presents the most problems for your state's enforcement agency?

2. Sea urchin and eel fishery
3. All pose problem. Federal/state waters in particular (those that fish in federal waters and then cross into state waters)
4. Recreational fishery (1.5 million) -- so many people. All commercial fisheries.
5. Hard clam
6. Blue crab
8. Summer flounder

What are some of the impediments to compliance with your state's licensing policy?

1. Manpower
2. *[There is a fold in the fax and I can't read the first line of this answer]* ...to licenses. Large areas. Enforcement of more laws deters from focus on license issues only.
3. Not able to pick those up not licensed -- man power.
4. None, really; licenses relatively cheap.
5. Need for backup shippers/dealers license. More enforcement effort.
6. Species FMP -- annual changes required in FMPs.
8. Compliance with licensing system is not really a problem.

What are some of the problems with the enforcement of your state's licensing policy?

1. Problems enforcing area closures due to pollution.
2. ...to licenses. Large areas. Enforcement of more laws deters from focus on license issues only.
3. Man power
4. Not enough people. Funding (no money from general legislature / all money from licensing).
5. Need for backup shippers/dealers license. More enforcement effort.
6. Ownership of vessels listed on licenses.
8. Some statutes appear to be contradictory or vague.

What is the dollar range of fines for violation of your state's commercial licensing policy?

2. $0 - $1,000 and/or up to 364 days in jail, or both.
3. $60 is the lowest. Set on number of violations.
4. $100 - $3,000. Can seize equipment and catch.
5. 0-$250
6. $25-$200
8. First offense: $100-$3,000. Subsequent: $200-$5,000.

What is the dollar range of fines for violation of your state's recreational licensing policy?

2. $0 - $1,000 and/or up to 364 days in jail, or both.
3. $60 is the lowest. Set on number of violations.
4. $20 for each illegal fish; striped bass $100

Are fines established so that they effectively deter violation of your state's licensing policy?

1. Yes and no -- depends on the judge.
2. No, in most cases. Violators are commenting, "It's the cost of doing business."
3. Depends on individual fishing operations.
4. In some cases yes and some no. Commercial guys see it as the price of doing business.
5. No
6. No
8. No, currently working on proposal to develop fines more in line of particular offense.

Which group has the most problem with violations of your state's licensing policy?

2. Sea urchin
3. Commercial
4. More recreational violations (sheer numbers). Commercial violations bigger as far as seriousness of violation.
6. Crabbers
8. Commercial

What is your estimation of the average number of reported violations per month for 1995?

3. 20 commercial; 20 recreational (6 summons)
4. 1994: 776 commercial; 800-1,000 recreational; (both get summons)
5. Don't know
8. 10 commercial; 40 recreational

FEE STRUCTURE

How are the fees for commercial licenses set?

1. Legislative
2. Legislature with consultation with DMR.
3. Through the legislature by recommendation by *(?)*
4. Marine Fisheries Council advises legislature, and legislature sets rang; MFS may get specific fee amount through discretion in authorizing legislation
5. Legislation
6. By the Delaware Code
7. General Assembly
8. Legislatively

How are the fees for recreational licenses set?

1. Legislature
2. Legislature with consultation with DMR.
3. Through the legislature by recommendation by *(?)*
4. Marine Fisheries Council advises legislature, and legislature sets rang; MFS may get specific fee amount through discretion in authorizing legislation
7. General Assembly

How are the proceeds from commercial fees used?

1. General fund
2. Unknown. Money is deposited in general fund and dispersed out from there.
3. Department operation
4. Money goes back to general fund; fine money goes to Fish and Wildlife. Shellfish goes to enforcement fund.
5. Management of marine resources
6. Shellfish licenses go to general fund. Finfish licenses go to a dedicated fund.
7. Not sure
8. Support Division Programs (dedicated fund)

How are the proceeds from recreational fees used?

2. Unknown. Money is deposited in general fund and dispersed out from there
3. Department operation
4. General fund

PROBLEMS WITH CURRENT LICENSING SYSTEM

What specific problems, if any, does your state have with its current system of licensing?

2. Too many different types of licenses. Ten species landed are generating monies, so we have become license-specific to fisheries. Three-fourths of other species fall under a specific license.
3. Don't have enough places to go to get licenses / not easily accessible.
4. Need ETS
5. Need for more efficient computer issuance system
6. Too confusing
7. Moratorium -- can't jump into new fisheries. Limiting new fishermen / limiting flexibility for those who are already in licensing system.

What problems are specific to the commercial sector of your state's fishery?

1. Effectiveness as a research tool, effectiveness as a regulatory tool.
2. Effectiveness as a research tool, effectiveness as a regulatory tool, compliance rates, enforcement of state's marine regulatory policy, fee structure.
3. Effectiveness as a research tool, effectiveness as a regulatory tool, compliance rates, enforcement of state's marine regulatory policy, fines for violations, fee structure
4. Enforcement of state's marine regulatory policy, fines for violations (fines need to be raised), fee structure (should pay more to fish); need better data collection -- no mandatory reporting required. Credibility problem / hard to convince fishermen programs are needed if data not available.
6. Effectiveness as a regulatory tool, enforcement of state's marine regulatory policy, fines for violations
8. Effectiveness as a research took, effectiveness as a regulatory tool, fines for violations, fee structure.

What problems are specific to the recreational sector of your state's fishery?

2. Effectiveness as a research tool, effectiveness as a regulatory tool, compliance rates, enforcement of state's marine regulatory policy
3. Effectiveness as a research tool, effectiveness as a regulatory tool, compliance rates, enforcement of state's marine regulatory policy, fines for violations, fee structure
4. Enforcement of state's marine regulatory policy, fines for violations, fee structure (don't pay anything); need saltwater license (funding). Need better data collection – no mandatory reporting required. Credibility problem / hard to convince fishermen programs are needed if data not available.
7. No real problems in her opinion -- so little recreational licensing.

Opinions

1. Problem: Do you close fisheries or do you leave fisheries open? Limit gear/technology. "Primitive fishing" -- no winches for trap fisheries. No trawls. Hook-and-line. Big battle: managed as public resource or private resource.