

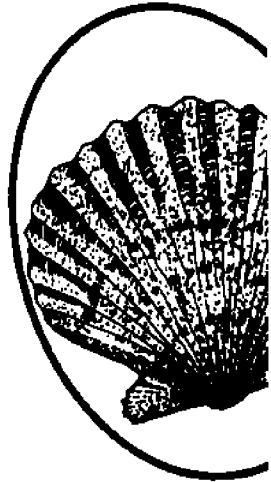
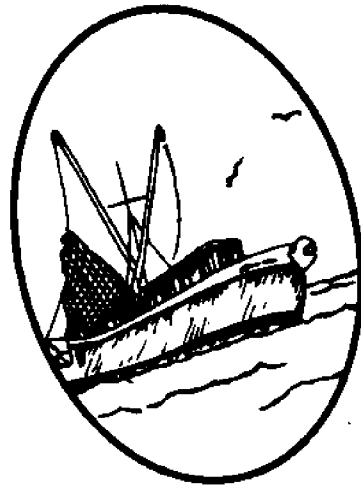
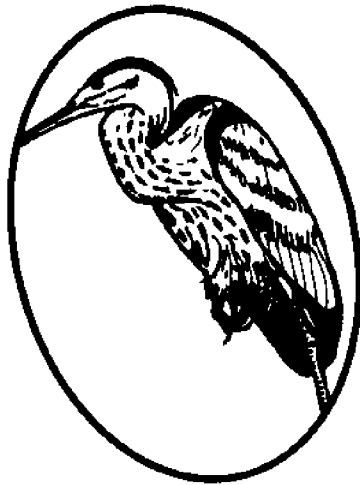
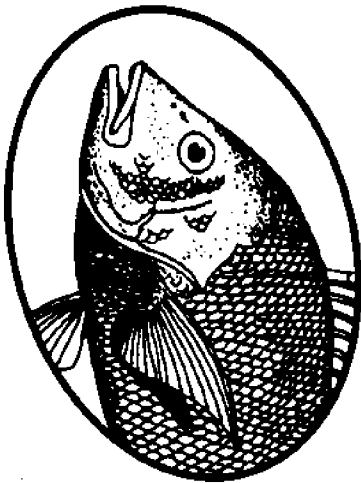
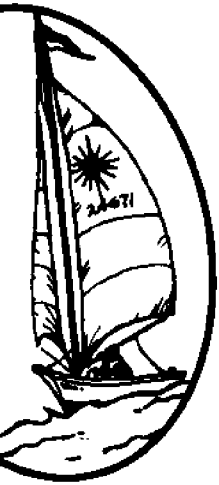
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# Implications of Proposed Management Measures For the North Carolina Sea Scallop Industry

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IMPLICATIONS OF PROPOSED MANAGEMENT MEASURES  
FOR THE NORTH CAROLINA SEA SCALLOP INDUSTRY

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## Introduction and Acknowledgements

This project was inspired by work first assigned by the South Atlantic Fishery Management Council during the Fall of 1980. The original effort was conducted under the aegis of a contract between the Department of Sociology/Anthropology, East Carolina and the SAFMC. As a council involved with an impending Fishery Management Plan (FMP) for sea scallops, the SAFMC assigned Bruce Austin (SAFMC staff) and John Maiolo (ECU) to preliminarily assess probable socio-economic impacts of proposed management measures which had been developed by the New England Council, on North Carolina fishermen and dealers. North Carolina is the only state in the South Atlantic which has had citizens involved in the Mid-Atlantic and Northeast sea scallop fishery.

During the preliminary work, it became clear that the bio-economic model (a term which best characterizes the FMP) was not sufficient to encompass important social and economic impacts of the recommended management measures for two reasons. First, the model does not adequately incorporate shoreside social organizational developments. Second, because of that limitation, emphasis is placed on ex-vessel economic yield in a maximizing sense, as opposed to broader economic and social yields (benefits), which would be more efficaciously measured in an optimum sense. Indeed, the legislative basis for such fishery plans, the FCMA, mandates an approach which stresses optimum yield for the overall benefit to the nation.

The preliminary work convinced the investigator that more detailed information on social and economic impacts of managing the sea scallop fishery needed to be gathered. Such information would benefit the development of the specific plan under consideration, and other plans as well. It would also contribute to this country's knowledge base of fishing peoples and communities. That knowledge base, particularly in regard to fishing social organization and occupations, is currently deficient, to say the least.

A proposal was written for Sea Grant funding which argued that many North Carolinians were involved in the sea scallop fishery in a significant way in the Mid-Atlantic and New England. As an opportunistic fishery, sea scalloping in North Carolina has developed into an impressive ongoing social and economic framework. The FMP under consideration has the potential of severely disrupting that framework. Research was needed and the story had to be told.

I am grateful to Dr. B. J. Copeland, North Carolina Sea Grant Director, for his recognition of the importance of the issues discussed here, and his willingness to quickly respond to the proposal.

Members of the South Atlantic Fishery Management Council and staff have been extremely supportive of my efforts. It must be made clear, however, that the SAFMC is not to be held responsible for the research and conclusions undertaken with Sea Grant Funding. Further, while data in this report may be used for Council decisions, if it so desires, there are no obligations to do so.

I am especially indebted to Dr. Jackson Davis, SAFMC Senior Scientist, who first involved me in the study of the management of sea scalloping. Jackson has the uncanny ability to see major social issues emerging in plan development.



I am also very much in the debt of Bruce Austin, SAFMC Economist, who helped me understand the biological, economic, and social issues at the secondary as well as the primary impact level.

The staff of the North Carolina Division of Marine Fisheries did its usual sterling job of steering me in the right direction, providing data, critiquing my work, and encouraging me to push on. Special thanks go to Katy West, whose data organizing skills (and patience) never cease to amaze me; Mike Street, who is always on top of every major fishing issue in the region, sea scalloping being no exception; and Connell Purvis, Robert Pittman, Jack Guthrie, and Manley Gaskill, who always seem to find time to discuss fishery issues with me, no matter how busy they are with other matters.

The dealers and fishermen involved in sea scalloping have been extremely responsive and cooperative for this study. It simply could not have been conducted without them.

While the contributions of the resource managers, policymakers, dealers and fishermen are acknowledged, the responsibility for the accuracy of this report lies with the investigator.

Finally, special thanks go to Wanda Elks for her patience in providing what must have seemed to be an interminable number of typed drafts of this report.

## The Problem

Under the FCMA of 1976, eight regional Fishery Management Councils are charged to develop management plans for the regulation of harvesting within the fishery conservation zone (FCZ). Further, councils are charged with regulating fish stocks throughout their ranges. Therefore, if a given species is harvested in more than one region, two or more councils (whichever number is appropriate) must jointly develop a plan.

In some cases, two or more councils have joint responsibility for developing plans. Each council must approve the plan(s) by a majority vote. Otherwise, the plan does not move forward for approval by the Secretary of Commerce. In other cases, a lead council is designated by NOAA/NMFS acting on behalf of the Secretary. In such instances, it is the lead council's responsibility to move the plan toward development and implementation while consulting other councils whose regions are involved. But, gaining their approval is not necessary. The other councils do have the right to recommend acceptance or rejection of the plan and make their positions known to NOAA/NMFS and the Secretary. The Secretary then decides whether the plan will be implemented or changed.

In 1978, the New England Fishery Management Council was designated as the lead council in consultation with the Mid-Atlantic and South Atlantic Fishery Management Councils to develop an FMP for Atlantic Sea Scallops (Placopecten magellanicus). During 1980, the New England Council published a draft FMP and Environmental Impact Statement (DEIS) on the fishery for review by the public and the other councils involved. As the development of the draft FMP proceeded toward completion, a consensus emerged among scientists and policymakers that the economic condition of the fishery had deteriorated at an alarming rate between 1978 and 1980. CPUE had decreased for both trawl/shellstocking and dredge/shuck-at-sea vessels, partly as a result of a dramatic increase in effort and partly due to a stock decline. Catch rates in 1980 were about one-half to one-third of the 1978 rate. Ex-vessel prices had increased, but not to a level to compensate for decreased landings and rising fuel costs. It was beginning to appear that the fishery had come close to the point where it was no longer profitable to fish for sea scallops (Austin and Maiolo, 1980:5).

In response to this condition, the New England Council, in its August 1980 DEIS and Draft FMP proposed the following:

...adoption of an age-at-entry control measure to be implemented on the basis of meat count for vessels shucking at sea...and minimum shell height for recreational fishermen and vessels landing sea scallops in the shell. The meat count is initially specified at 30 meats per pound, and shell height is determined accordingly. (N.E. Council, DEIS, 1980:1)

Because of some apparent uncertainty as to the relationship between shell size and meat count plus some early negative reactions from shellstockers, the plan provided for two options for shellstock harvesting, with the final one to be chosen after public hearings (spring and summer of 1981). The options stated were:

- a) the cull size in the commercial shell-stocking...and recreational sea scallop fishermen shall be 3 3/8 inches (standard shell height) with a 1% tolerance...for shells under 3 3/8 inches; or
- b) the shell height of sea scallops taken in the commercial shell-stocking...fisheries shall average 3 7/8 inches. (N.E. Council, DEIS, 1980:4).

North Carolina shellstockers and processors reacted with shock and anger at the New England Council's proposals. It was (and is) their feeling that it would not be profitable for shellstockers to fish with a 30 meat count regulation. With the current state of the exploitable stock, fishermen and processors contacted during the fall of 1980, and again during the spring of 1981, agreed that shellstockers are dependent on higher meat counts than 30 (averaging about 40). Further, the fishermen and dealers argued that the proposed regulations were discriminatory in a way to favor New England dredgers at the expense of North Carolina fishermen, particularly shellstockers.

Problems in the fishery, from the standpoint of American fishermen and resource managers, are exacerbated by the participation of Canadians, in two ways. First, portions of the extremely productive Georges Bank fishing grounds are still the subject of a border controversy between the United States and Canada, which is not likely to be resolved in the near future. Second, the Canadian regulations under their version of extended jurisdiction, permit sea scalloping by Canadian fishermen of 40 count scallops, and a 10% tolerance is also permitted.<sup>1</sup> The true count, then, is 50 meats per pound. Thus, it is conceivable that Canadians will be able to harvest smaller scallops in essentially the same areas where Americans fish. Along with this, currently, there are no import restrictions on the scallops harvested by Canadians. The Councils involved, in the U.S., have attempted to obtain Federal Government support for import restrictions on the smaller scallops, but this has not been forthcoming. A worst case scenario puts American fishermen, especially North Carolinians, at a tremendous competitive disadvantage in that they may not be able to harvest the same scallops as Canadians, caught on the same fishing grounds. Along with this, the very stock where rehabilitation is the FMP focus will still remain "under seige" in the sense of harvesting smaller scallops by the Canadians. Then, those same scallops may be imported to the U.S. and will compete in the market with those caught by American fishermen.

Prior reports on the FMP development by the principal investigator, along with those written by others, have produced a concern by the South Atlantic Council about meat counts lower than 40, and the questions related to Canadian harvesting. The combined concerns of the SAFMC and North Carolina fishermen were communicated to the New England Council in both formal and informal ways.

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<sup>1</sup>Canada also has trip limits and limited entry (capped at 77 vessels). There are unallocated licenses available at the present time; and trip limits are well beyond actual trip lengths taken due to the condition of the fishery.



At the July meeting of the New England Council, a 40 meat count was adopted for shucked-at-sea scallops along with a 3 1/4 inch minimum shell size for shellstockers. There is no tolerance for shucked-at-sea scallops, but a 10% tolerance for shellstocked scallops (on shell height).

Implementation is scheduled for early 1982. In 1983, the plan calls for the reduction to a level as low as 30 meats per pound and an increase in shell height to 3 1/2". The NMFS Regional Director may be granted authority by the Council to change the count five meats per pound (and equivalent shell height) each 12 month period thereafter (McCoy 1981).

A possession law to deal with Canadian imports was adopted as an inseparable part of the plan. The Mid-Atlantic Sea Scallop Steering Committee endorsed the New England Council position at an August meeting. All of this is to say that more deliberations are likely to occur and it shouldn't be an exaggeration to suggest that they will be heated.

### Methodology

Every fish house determined to be involved with scallops (sea and calico) in the state of North Carolina was contacted. The final list was developed from discussion with NCDMF personnel, personal contacts with sea scallop fishermen and dealers, and results from the East Carolina University shrimp dealer project (conducted during the Spring of 1981), which served as a crosscheck. The total number of fish houses contacted was 15. Contacts consisted of personal visits to the fish houses (as many as five for some dealers) and telephone conversations.

A standardized interview format was used to compile information but conversations were open ended. Where it was feasible, dealers provided very specific information on dollar amounts and personnel. Obviously, the organization of this report has been designed so as to not reveal findings which would identify particular dealers.

Captains and some crewmen were interviewed when possible. In many cases interviews could not occur since the potential respondents were out of port engaged in fishing. Efforts are being continued in this area to enlarge the sample size. Some interviewing occurred with fish house permanent personnel and seasonal shuckers. This effort is also incomplete and will be reported on in more detail at a later date.

Records were found to be incomplete and/or inaccessible in some cases. Memories of past years had begun to fade. Yet, there was enough information produced to show that sea scalloping has become a major industry in North Carolina. Where errors in estimates occur in this report, the reader should assume that they understate numbers of boats, dollars and people involved. Even with that, the figures are surprisingly large.

Three public hearings were attended by the investigator. As a technical consultant to the South Atlantic Council, he participated in all three. The hearings were organized by the New England Council. Two of them were presented

specifically at the behest of the SAFMC in order to provide North Carolinians with ample opportunity to respond to the proposed regulations. The hearings proved to be a valuable source of information for a better understanding of the plan development and industry personnel response.

Documents pertaining to the Sea Scallop FMP (produced in Boston, Charleston and Morehead City) were examined, along with federal and state publications on landings, value, participants, gear and boats. More than a few inconsistencies were found. They were resolved, for the purposes of this report, by conversations with knowledgeable resource managers, dealers and fishermen.

It was noted previously that debates on meat counts and shell heights are likely to continue. As such, this project does not end with the data gathering efforts in 1981. It was noted, also, that the bio-economic model--which begins by assessing stock levels and reproductive capacity, and ends at the dock with estimates of maximized exvessel economic yields--does not seem to sufficiently grasp the ubiquitous social and economic impacts of proposed management measures. As a result, the more comprehensive social organizational framework, which has been employed in the study, will continue, i.e., contacts to update the organizational, as well as economic, parameters of the sea scallop industry.

#### Scalloping: An Opportunistic Fishery in North Carolina

North Carolina's commercial fishermen have always exhibited tremendous versatility in their fishing activities. A number of factors contribute to this. As the northern boundary for some fish stocks, and the southern boundary for others, the state's estuaries and offshore fisheries exhibit a wide variety species, but also fluctuating harvest abundance. The latter is due to environmental conditions which affect both stock levels and the opportunity to fish. Most of North Carolina fishing activity is (and has been) oriented toward estuarine and nearshore harvesting and this is reflected in boat design and fishing technology.

For the past 30 years, more and more activity has been focused on shrimping. It has become the most important fishery both in terms of effort and value (See Maiolo, et. al., December, 1980). It is a fishery which is relatively inexpensive to enter (especially when costs are compared to returns in the good harvest years), demand has remained high (and increased over the years), and stocks have remained sufficiently abundant to draw more effort. There have been, however, severe short term stock fluctuations, and the season is limited (most activity occurs from May through September). These factors, no doubt, have contributed to the continuing versatility of many of North Carolina's fishermen (winter trawlfishing and gillnetting, crabbing, bay scalloping, oystering and clamming traditionally being the most important as switching occurs across fisheries by season or stock availability).

The struggles North Carolina's fishermen must face--uncertainties of weather, fish stocks, and markets--have produced more than a versatility. They have produced an ethic of opportunism, that is, a willingness to adapt very quickly to changing conditions. This ethic, and the social structural (community)

underpinnings which support it represent the basis for the emergence of sea scalloping as an important commercial activity during the 1970's.

It is important to note here that the calico scallop fishery developed in North Carolina in 1959, and grew rapidly. It is a fishery where shoreside shucking is required. This set the stage for the later entrance of scallop nets into the sea scallop fishery, a type of gear which was developed originally for calico scalloping. The use of net gear is a consequence of the design of many of the boats which first entered the fishery in that, since they were wooden hulled shrimp boats, they could not be used with steel dredges.<sup>2</sup> Thus, this period was important for the sea scallop fishery, which developed later, in that the social organization and technology, which was developed for the calico scallop fishery, was easily adapted to sea scallop netting and shellstocking.

North Carolina fishermen first entered the sea scallop fishery in the Mid-Atlantic as early as 1965 (three boats fishing off of the coast of New Jersey) when 91,700 pounds of meat were landed in the state (valued at \$56,000). Published reports indicate that all of the scallops were landed by dredge boats and had been shucked-at-sea.

There were no sea scallops landed in the state in 1967, and the period from 1970-74. Shrimping was good during the late sixties, and calico scalloping was most profitable, which no doubt affected sea scalloping effort. A record calico scallop catch occurred in 1966 and 14 million lbs. were landed in 1967. Available data for the period under study (in regard to sea scalloping) are presented in Table 1.

Shrimp production remained high in the 1970's through 1977 with record prices. No doubt this affected activity in the sea scallop fishery in the period from 1970 to 1974. It was in 1975, however, that a noticeable entry of seven North Carolina shellstocking vessels and one with dredges entered the Mid-Atlantic and New England sea scallop industry.<sup>3</sup> Modified calico scallop trawls, with 85' headrope and 3" stretched mesh, were used and excellent catches resulted. The presence of experienced calico scallop hand shuckers, and the development of shucking machines, made it profitable to harvest at sea with shrimp boats, and bring the shellstock back to North Carolina for processing.

Even though only 421,000 lbs. were actually landed in North Carolina in 1975, 812,000 lbs. were processed in the state (many scallops were landed at Mid-Atlantic ports, often by out-of-state vessels, and were shipped to North Carolina for processing). This yield would result in estimated shoreside wages of about a quarter of a million dollars or well over \$1,000 in average supplementary wages for most of the shuckers. (See Table 1).

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<sup>2</sup>Wooden boats cannot stand the stress of dredging nor the weight of the dredges on the free board as the dredges are hauled up. Some modification of two wooden boats did occur, which made dredging possible. We will discuss those later.

<sup>3</sup>This discussion is partially based on the document "North Carolina's Sea Scallop Fishery", NCDMF, Morehead City, May 1977.

Table 1  
 Number of North Carolina Boats  
 in Sea Scalloping, Personnel  
 Estimated Shoreside Wages,  
 and Estimated Total Value By Year

Year	Boats/Crew	Jobs For Shoreside Personnel in N.C.	Shoreside Wages	Lbs. Landed By N.C. Boats And/Or Processed In N.C.	Estimated Total Value
1965	3/12	4 <sup>1</sup>	\$ 2,000	91,000	\$ 64,000
1968	3/12 <sup>2</sup>	4 <sup>2</sup>	2,000 <sup>2</sup>	41,700	48,000
1969	3/12	2 <sup>2</sup>	1,000 <sup>2</sup>	12,600	15,000
1975	7/35	200	250,000	421,000 landed 812,000 processed	800,000
1976	29/160	300	300,000	1,107,000	1,853,770
1977	29/160	300	184,806	657,092 <sup>3</sup>	1,243,699
1978	70/232	631	306,000	1,971,585	6,909,784
1979	60/180 <sup>4</sup>	400	253,530	1,693,900 <sup>5</sup>	5,719,952
1980	50/150 <sup>4</sup>	400	52,576	861,012 <sup>6</sup>	3,359,641 <sup>7</sup>

<sup>1</sup>All scallops shucked-at-sea. These are crude estimates.

<sup>2</sup>Data unavailable. Estimates are extrapolated.

<sup>3</sup>Shucked scallops landed at out of state ports undetermined but estimated to be insignificant.

<sup>4</sup>Best available estimates. These will need further verification.

<sup>5</sup>52% shucked-at-sea.

<sup>6</sup>60% shucked-at-sea.

<sup>7</sup>Does not include out of state sales by N.C. boats.

Twenty-nine North Carolina vessels fished for sea scallops in 1976 (four shucked part of their catches at sea). All sizes were harvested and it has been estimated that of the 1,107,000 lbs. landed in 1976, all but a few were landed in nets. The NCDMF reports that catch rates were 100 bushels per one hour tow. It is estimated that the harvest level produced 160 jobs for crewmen, and, at 10 shucking houses, 300 shoreside people were employed. The ex-vessel value of the scallops was \$1,432,000; and, it is estimated that \$320,000 in wages for shucking resulted.

The year 1977 produced 657,092 lbs. of sea scallops landed in North Carolina, valued at \$953,958.<sup>4</sup> All of these scallops were landed by nets. About 29 vessels were used, employing 160 crewmen, and an estimated 300 shoreside shuckers were involved. Seventy-four percent of the landings occurred in Carteret County, the remainder in Dare.

The year 1978 saw dramatic changes in the fishery. In-state landings totalled \$4,444,166; boats from Pamlico County entered the fishery for the first time; shellstocking accounted for 45% of the catch which totalled over two million dollars. Seventy vessels were geared up for the fishery--26 from Carteret County, 18 from Pamlico, 3 from Hyde and 23 from Dare. About a dozen boats were equipped to dredge while the remaining vessels (58) were shellstockers (some of the dredges were equipped for netting scallops as well).

Shellstocking during 1978 produced 232 jobs for boat crewmen; nearly 600 jobs for shuckers<sup>5</sup>; and 31 for other support personnel (mainly offloaders who work at the fish houses on a regular basis with about one-third of their incomes coming from work related to sea scallops). The 884,022 lbs. of shellstock landed in the state produced 110,502 gallons. A conservative estimate places shucking wages at \$2.50 per gallon which totals over \$276,000 in wages paid to part-time shucking help. As in prior years, the industry contributed an average of about \$1,000 to shuckers' family incomes. It is estimated that another \$30,000 was paid to non-shucking support personnel for work performed in the sea scallop fishery. Another five to six hundred thousand dollars (six is used in Table 1) was added to the value of the fishery through sales. Thus, not taking into account scallops shucked-at-sea, and/or landed out of state, and not taking into account profits made after the scallops left the fish houses (e.g., in restaurants), nearly three million dollars in income was produced in North Carolina in 1978 by shellstocking. It is estimated that at least four million dollars can be accounted for by shuck-at-sea, and out of state landings, and this is felt to be a conservative estimate! We have, then, an industry producing two million ex-vessel dollars more than the shrimp industry in ex-vessel value during the same year, counting shellstock and shuck-at-sea.

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<sup>4</sup>These figures do not include shucked-at-sea scallops landed in the Northeast by North Carolina boats.

<sup>5</sup>At any given time. The probability is high that nearly 2500 people did shucking but about 550 to 600 is the capacity at any particular time. There is a great deal of turnover in the industry with a "core" group of about 400. The remaining 2100 positions turnover frequently. One shucking house hired a total of nearly 700 different people during one season.

To be sure, shrimping experienced a disastrous year but, over the long pull, it is considered to be North Carolina's most valuable fishing resource. Further, the fact that it was in a down year is important from the perspective presented here. In a down shrimp year, 58 large shrimp boats were able to turn to sea scalloping as an alternative. Along with this, hundreds of shoreside personnel, 90% of whom were women, could benefit financially from the presence of shellstocking.

In 1979 landings slipped to 1,693,900 lbs., but the exvessel value increased to \$4,897,678. Shoreside pay slipped to about a quarter of a million dollars as landings dropped even though the percentage of shucked-at-sea scallops decreased from 55% to 52%. In 1980, a dramatic decrease in landings occurred (to 861,012 lbs.) along with a 39% decrease in exvessel revenues, shoreside wages, and fish house sales.<sup>6</sup> The price per lb., exvessel, did increase from \$2.89 to \$3.46 to offset some of the loss of harvest.

Landings data for both fisheries are substantially off for 1981 during the time of this writing. Shrimp production is estimated to be off by nearly 60% of the average, depending upon fall catches of pink shrimp; and sea scallop harvesting is off by more than 50%. Many vessels have become involved in the harvest of calico scallops in Florida and shrimping in the Gulf, where bumper harvests are occurring.

#### Technology and Social Organization of the Fishing Effort

Modern dredge vessels are normally steel hulled. An exception to this was the entry of two 81' wooden, shrimp trawler vessels with steel sheathing in 1979. Steel hulled vessels ranged in size from 72' to 104' (in 1978), with an average of 84'. Since then several boats have entered the fishery at between 92 and 112 feet.

Dredge boats can accommodate a crew of up to nine, for the larger vessels, and normally carry two dredges which are alternately towed and pulled up. The dredges scrape the bottom with the scallops being retained by a net of steel rings. Mesh sizes are adjusted by adding or removing links between the rings. During the past few years, dredge boats have adopted the so-called "Canadian" configuration which incorporates enough links to retain very small scallops.

Scallops are shucked at the stern of the vessels in a specially built cabin equipped with a shucking board. This is an especially important feature in that culling can occur in the event that size limits are eventually put into place.

Conversion costs to dredging ranged from 25 to \$40,000 in 1978, depending upon the size of the boat and the presence of appropriate booms and hydraulic winches. The dredges themselves cost more than four thousand dollars each--one spare was normally purchased. Conversion costs in 1981 were about 20% higher than in 1978.

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<sup>6</sup> Shoreside wages were affected by the fact that shuck-at-sea exvessel values did not drop as dramatically (27%) as did those for shellstock (46%).

Crew shares on dredge boats averaged about \$14,000 during the "hot" season of 1978. About 50% of the crew turned over quite often making the range from about \$6,000 for some (who would seasonally switch to other fisheries) to \$25,000 to those who would stick it out through the heart of the season (May through August). Captains' shares averaged about \$30,000 with a range from \$15,000 to \$50,000. It should be kept in mind that we are not talking about annual, but seasonal wages.

Economic remuneration is enriched by a tradition called "shacking." Crewmen hold out smaller scallops from the total payload, sell them on their own and split the money received. Everyone in the industry is aware of the custom and seems to accept it. There is no way to estimate revenues from shacking, but it does not seem to total more than a few hundred dollars per trip. It is considered to be "mad" money for entertainment.

Net boats are mostly wooden hulled and range from 30' to 104'. The larger net boats are steel hulled and equipped to dredge or net. Nets are 3" to 5½" mesh with tickler chains similar to shrimp trawls. In fact, some of the nets used are shrimp, calico scallop and fish nets. Whereas dredges are fished in water from 240 to 600 feet, nets are not used in waters more than 150 feet in depth.<sup>7</sup> A great deal of netting occurs in water under 100 feet (as low as 70').<sup>8</sup>

A crew of five is the upper limit for most net boats. Scallops are left in the shells and transported to shucking houses in the state--Harkers Island, Salter Path, and Snead's Ferry, mainly. Because the stock remains in the shell, trip lengths cannot exceed 10 days. Otherwise, product quality will suffer. Thus, while shuck-at-sea boats can remain at sea until they load up (normally, not more than two weeks), shellstockers travel to the grounds (average of two to three days), fish for two to four days, and then must steam to port for off-loading and shucking.

Shellstockers would have an extremely difficult time culling the stock in that it is dumped on board with other scallop stock already landed. To cull would drastically cut into fishing time. Keeping in mind the trip length limitations once fishing begins (no more than seven days), it would be difficult to fill the holds (therefore, decreasing returns for effort).

Some of the shellstock boats use shrimp or calico scallop nets, as noted previously. Sea Scallop nets cost \$1100 each in 1978 (20% higher in 1981). Two spares are often carried on board. Each net has a life of about one scallop season. Thus, conversion costs in 1978 were relatively inexpensive (\$3300).

Crew and captain shares for shellstock boats have been difficult to estimate. But, because of the size of the load shellstockers are able to carry on board, they have to be substantially less than those on dredge boats--perhaps by as much

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<sup>7</sup> Strong tides in the Northeast prevent netting in deeper water. The "doors" at the mouths of the nets roll and the nets foul.

<sup>8</sup> Some of the wooden boats used in the sea scallop fishery, although also used in the shrimp fishery, were originally built for winter trawlfishing. These are the larger wooden boats (over 70').

as one-half. The same crews, however, (on net boats) are the most likely to turn to shrimping in the summer. In a good shrimp year, the combined remuneration for sea scalloping and shrimping is likely to compare very well with dredge boat crews.

As the sea scalloping fishery developed for North Carolinians, boats became larger, and investment in the fishery, greater. This has reduced some of the flexibility for the newer boats in the fishery which means that management measures could substantially affect the dredge boats as well as shellstockers, a fact which has been overlooked in documents related to the FMP. Michael Street, (NCDMF, personal communication) has suggested that, for a large portion of North Carolina vessels, perhaps 50, there has been a shift from participation in sea scalloping as an opportunistic fishery, to one more appropriately labeled a directed fishery. Some of these may redirect effort toward the shrimp fishery in an abundant year. But, for at least 20 of those vessels, effort would be directed toward scalloping irrespective of shrimp abundance; and, the remaining number would shrimp for only about two months. Their first choice is scalloping.

Several factors account for this shift away from overlap (between scalloping and other fisheries). First, the newest vessels into the sea scallop fishery are steel hulled. They have been built for scalloping (although they can be converted to fish trawling). They are not suitable for nearshore and estuarine shrimping, not only because of size, but because of the costs to operate them. Wooden vessels in the 51' to 70' range continue to have shrimping as an option.

Calico scalloping in Florida by North Carolina boats has proven to be a rapidly growing opportunistic fishery for at least 26 boats that would have scalloped in New England, or shrimped in North Carolina (during 1981), had stocks been sufficiently abundant. The presence of newly discovered calico beds, plus the downturn in Mid-Atlantic sea scalloping, has created a scenario very much like that we have discussed previously in regard to sea scalloping. That story will need to be chronicled soon. Recently, the SAFMC decided that the calico fishery did not need an FMP, at present. But, as those energetic North Carolina fishermen increase both fishing and processing effort, fishermen in Florida may soon demand Council action just as the New Bedford fishermen did in 1978.<sup>9</sup>

In any case, the most recent development in calico scalloping has played an important role in the decline in overlap across fisheries.<sup>10</sup> It is suspected, however, that a surefire bumper year in the shrimp fishery would draw some of the calico scallop boats back to North Carolina, at least during the high yield months (especially July).

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<sup>9</sup>Several North Carolina dealers have initiated plans to process Florida scallops in Florida. This is a different twist than the scenario played out in the Northeast. All shellstocked scallops from the Mid-Atlantic (caught by North Carolina fishermen) were transported to the Tar Heel State for shucking.

<sup>10</sup>It is ironic that the same fishery, e.g., calico scallops, which contributed to overlap in the first place, has now developed to the point of reducing such overlap.



## Shoreside Employment in the Industry

All of shoreside support personnel (mainly offloaders, weighers, general work) are men. The story is different for shuckers. In the northern counties about 80% of the shuckers are women, and most are black. These are secondary earners with limited alternative employment opportunities and are normally transported from towns farther inland.

The central and southern region shuckers are mostly white, female, and live near the fish houses. They combine shucking activities with shrimp heading and fish filleting and packing. Black women in the central and southern regions who shuck scallops also shuck clams and oysters and pick crabs.

An energetic shucker can earn an average of \$50 per day for a five or six day work week. More than a few have earned between three and four thousand dollars during a single four month season from shucking alone. Most of the regulars average about \$1,000 per season; the others a few hundred dollars.

Our best estimate is that over 2,500 women in the state have been available to participate in the fishery, about 1,000 on a regular basis. Of the 2,500, it is estimated that half are black; of the 1,000 regulars, it is estimated that 700 are black.

To the degree, then, that shellstocking effort for sea scallops decreases--whether because of stock declines, the increase in landings of dredge and shuck-at-sea scallops to the detriment of shellstocking, or management measures--a sizeable number of poor and near poor women, many of whom are important secondary earners with minority status, will be occupationally dislocated. And, to the extent that their opportunities for alternative work are limited, a serious unemployment problem can emerge.

The objectives of the New England FMP include a "...program which meaningfully addresses the achievement of long-term benefits to the region..." resulting in a maximization of "...the joint social and economic benefits..." by considering (1) stock restoration in terms of abundance and age distribution, (2) "enhancement of yield--per-recruit..." etc. The Council estimates that an increase of 16% in meat weight is achieved when comparing a 30 to a 40 meat count; and 40% when comparing 30 to a 60 count (NEFMC, May 1981, pp. 2-3). North Carolina fishermen argue that a count of less than 40 will put shellstockers out of business. Scientists and resource managers from outside of the New England region question the assertion that a 30 meat count is required to create the most effective biological/economic yield. Whatever the case, an increase in economic yield to the nation, especially in terms of measures where there is a lack of consensus as to their necessity, is hardly solace to the women in the industry who count on earning income from shellstocking, and who stand to lose that income under proposed management measures.

## Concluding Notes

To be sure some form of management plan is necessary to ensure stock recovery and maintenance in the sea scallop fishery. The New England Council has argued that a 30 meat count (or less) is necessary to do so and that maximizing yield is a necessary goal. Throughout the conduct of this research, with a few exceptions, the investigator found no disagreement with some form of control over harvesting.

North Carolinians argue that the 30 count is a function of pressure from New Bedford fishermen who want North Carolina boats out of their region. They point to the example where some members of the New England Council switched to favor a 40 count when the New Bedford fishermen changed their minds (Spring, 1981) after considering the impact of the 30 count on their own fishing successes. They point to the example where effort control (i.e., limited entry) is continually under consideration. If such control is implemented, it will be based on that which the New England Council has labeled "historic effort." This is a subject of considerable concern since North Carolinians are the newest kids on the block and, perhaps, the most vulnerable, if historic effort is defined as that which began prior to North Carolina's entry.

No one has suggested the management under the FCMA of 1976 would be easy. And no one has suggested that the law is all that clear. But, some parts are very clear, especially National Standard (1) which mandates "optimum" not "maximum" yield; (4) which states that "...management measures shall not discriminate between residents of different states...", calls for "...fair and equitable..." allocation to "all fishermen" when allocation is necessary, and that "...no particular...entity...acquires an excessive share of privileges;" and (5) which states "...that no...measure shall have economic allocation as its sole purpose." (FCMA Section 30. Italics mine).

If management under the FCMA is to work, it must be both objectively and subjectively fair. It will be difficult, indeed, to convince North Carolina fishermen, dealers, and processors that a plan which they perceive is directed toward improving stocks and the economy of the sea scallop fishery, at their expense, is fair. They see the smaller boats and shoreside personnel being pushed out of the industry. They see that, as the stocks recover, renewed efforts will be in the form of larger boats with dredges, thereby producing larger economic benefits for fewer people, all males, mostly white.

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