AMENDMENT #8

FISHERY MANAGEMENT PLAN FOR THE

ATLANTIC SURF CLAM AND OCEAN QUAHOG FISHERY

July 1988

Mid-Atlantic Fishery Management Council

in cooperation with the

National Marine Fisheries Service

and the

New England Fishery Management Council

Draft adopted by MAFMC: 14 July 1988
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2. SUMMARY

2.1. The objectives of the Atlantic Surf Clam and Ocean Quahog Fishery Management Plan (FMP) are:

1. Conserve and rebuild Atlantic surf clam and ocean quahog resources by stabilizing annual harvest rates throughout the management unit in a way that minimizes short term economic dislocations.
2. Simplify to the maximum extent the regulatory requirement of clam and quahog management to minimize the government and private cost of administering and complying with regulatory, reporting, enforcement, and research requirements of clam and quahog management.
3. Provide the opportunity for industry to operate efficiently, consistent with the conservation of clam and quahog resources, which will bring harvesting capacity in balance with processing and biological capacity and allow industry participants to achieve economic efficiency including efficient utilization of capital resources by the industry.
4. Provide a management regime and regulatory framework which is flexible and adaptive to unanticipated short term events or circumstances and consistent with overall plan objectives and long term industry planning and investment needs.

2.2. The management unit is all surf clams (*Spisula solidissima*) and all ocean quahogs (*Arctica islandica*) in the Atlantic EEZ.

2.3. The management measures (section 9.1) are:

2.3.1 Catch limitations The annual Optimum Yield, Domestic Annual Harvest, Domestic Annual Processing, and annual quota for surf clams equal between 1,850,000 and 3,400,000 bu (approximately 31.5 - 57.8 million lbs of meats). The annual Optimum Yield, Domestic Annual Harvest, Domestic Annual Processing, and annual quota for ocean quahogs range between 4.0 million bushels and 6.0 million bushels (approximately 40 - 60 million lbs of meats).

2.3.2. Permits and fees

Two permits are needed to fish for and land surf clams and ocean quahogs. One permit is a fishing vessel permit and the other is an allocation permit. Vessels taking surf clams or ocean quahogs for personal use are exempt from this requirement. Personal use is defined as the harvest of surf clams or ocean quahogs for use as bait, for human consumption, or for other purposes (not including sale or barter) in amounts not to exceed two bushels per person per trip.

Processors and dealers are also required to obtain a permit.

2.3.2.1. Vessel permits

Any vessel of the United States is eligible for a fishing vessel permit. Vessels previously in the fishery must have submitted all required logbook reports.

The Regional Director may establish fees for the fishing vessel permit.

Fishing vessel permit applications are processed by the Regional Director. The application form shall require provision of at least the following information: names, addresses, and telephone numbers of the owner and operator; the name of the vessel; the vessel's US Coast Guard documentation number or State license number; engine and pump horsepower; home port of the vessel; directed fishery or fisheries; fish hold capacity (in cages or bushels); dredge size; and number of dredges. The vessel owner or operator is required to notify NMFS of any changes of address or physical characteristics of vessels.

A fishing vessel permit is valid only for the vessel for which it is issued.

The fishing vessel permit must be carried, at all times, on board the vessel for which it is issued, and must be maintained in legible condition. The permit, the vessel, its gear and catch shall be subject to inspection upon request by any authorized official.

Fishing vessel permits expire on 31 December of each year.

Vessel owners or operators who apply for a fishing vessel permit must agree as a condition of the permit that the vessel's fishing, catch and pertinent gear (without regard to whether such fishing occurs in the EEZ or

landward of the EEZ, and without regard to where such fish or gear are possessed, taken or landed) will be subject to all the requirements of this part; provided, however, that such owners or operators fishing exclusively within waters under the jurisdiction of any State which prescribes minimum surf clam sizes or requires cage tags shall not be subject to conflicting Federal minimum sizes or tagging requirements. All such fishing, catch and gear will remain subject to any applicable state requirements. If a requirement of this FMP and a management measure required by State law differ, except for measures respecting surf clam minimum sizes and cage tagging in States which require either, any vessel owner or operator permitted to fish in the EEZ must comply with the more restrictive requirement.

Vessel permits may be suspended, revoked, or modified by the Regional Director for violations of this FMP.

2.3.2.2. Processor/Dealer Permit

Any processor or dealer of surf clams or ocean quahogs must have a permit maintained at their principal place of business.

An applicant must apply for a Processor/Dealer permit in writing to the Regional Director. The application must be signed by the applicant and submitted to the Regional Director at least 30 days before the date upon which the applicant desires to have the permit made effective. Applications must contain the name, principal place of business, mailing address and telephone number of the applicant. The Regional Director will notify the applicant of any deficiency in the application. If the applicant fails to correct the deficiency within 15 days following the date of notification, the application will be considered abandoned.

Except as provided in Subpart D of 15 CFR Part 904, the Regional Director will issue a permit within 30 days of the receipt of a completed application.

A permit expires on December 31 of each year or if the ownership or the dealer or processor changes.

Any permit issued under this section remains valid until it expires or is suspended or revoked or ownership changes.

Any permit which is altered, erased, or mutilated is invalid.

The Regional Director may issue replacement permits. Any application for a replacement permit shall be considered a new permit.

A permit is not transferable or assignable. It is valid only for the person to whom it is issued.

The person to whom a permit is issued under this section must maintain it at his/her principal place of business. The permit must be displayed for inspection upon request by an authorized officer or any employee of NMFS designated by the Regional Director.

The Administrator may suspend, revoke, or modify, any permit issued or sought under this section. Procedures governing permit sanctions or denials are found at Subpart D of 15 CFR Part 904.

The Regional Director may, after publication of a notice in the Federal Register, charge a permit fee.

Within 15 days after the change in the information contained in an application submitted under this section, the person issued the permit must report the change in writing to the Regional Director.

2.3.2.3. Allocation permits

2.3.2.3.1. General provisions of allocation permits

Surf clams and ocean quahogs must be landed pursuant to an allocation permit. An allocation permit takes the form of (1) an individual allocation certificate specifying the share of the annual surf clam and/or ocean quahog quota the allocation is worth, (2) surf clam and/or ocean quahog cage tags equivalent to the cages resulting from applying the individual allocation to the annual quota, and (3) any documentation issued by NMFS concerning the transfer of individual allocations and cage tags.

The Regional Director may establish fees for the allocation permit; that is, issuing the allocation permit document, issuing the annual allocation of cage tags, and issuing any documentation concerning the transfer of cage tags and allocations. Authorization to charge administrative costs includes allowing the Regional Director to arrange for cage tags to be produced and distributed by a specified vendor.

Only persons qualified to own permitted fishing vessels under United States law are eligible to own allocation permits.

Information concerning allocation permits is considered public information since it is information given to the fishermen by NMFS rather than information received from the fishermen, which is specified by the Magnuson Act as confidential.

Allocation permits may be suspended, revoked, or modified by the Regional Director for violations of this FMP.

2.3.2.3.2. Issuance of allocation permits

Within two calendar quarters following implementation of this Amendment, allocation permits will be issued to owners or operators of permitted vessels which harvested surf clams or ocean quahogs (based on logbook reports) between 1 January 1979 and 31 December 1988. The amount of the initial distribution (that is, the percentages shown on the individual allocation permit) of surf clams will be based on the following formula.

For vessels with permits to fish for surf clams and ocean quahogs in any Area (that is, vessels with permits issued pursuant to the moratorium; permits designated by NMFS as SF-1) the initial surf clam distribution will be based on the following formula:

a. The surf clam catch (in bushels) that each permitted vessel caught (based on logbook reports) for calendar years 1979, 1980, 1981, 1982, 1983, 1984, 1985 (counted twice), 1986 (counted twice), 1987 (counted twice), and 1988 (counted twice) will be determined.

b. The worst two years will be deleted from each vessel's history. The resulting number (in bushels) will be summed for the entire fleet and each vessel's ratio of the total calculated.

c. The cost factor (vessel length × width × depth) of each vessel will be calculated, summed for the fleet, and each vessel's ratio to the total calculated. The vessel's historical ratio contributes 80% to the vessel's initial allocation. The cost factor contributes 20% to the vessel's initial allocation.

For vessels with permits to fish for surf clams in only the New England Area (permits designated by NMFS as SF-7) the surf clam catch will be the average of the catch for the years actually fished between 1979 and 1988, inclusive. The lowest catch year will be deleted from each vessel's history. This number (in bushels) will be included in the total for the total surf clam fleet (moratorium and New England Area only) to calculate the individual vessel's ratios. They will then be included with the moratorium vessels in the above allocation.

For purposes of calculating historical participation, vessels that have replaced other vessels will be credited with the catch of the vessels they replaced.

The amount of the initial distribution (that is, the percentages shown on the individual allocation) for ocean quahogs will be based on the following formula:

a. The average ocean quahog catch (in bushels) that each permitted vessel caught (based on logbook reports) for those years the vessel actually reported landings for calendar years 1979 through 1988, with the vessel's lowest catch year not counted, will be determined.

b. The sum of all of the vessels' averages will be divided into each vessel's average to calculate each vessel's ratio to the total.

c. The ratio will be applied to each year's annual quota to calculate each vessel's annual allocation.

Prior to issuing the initial allocation permits, the Regional Director will inform each vessel owner or operator of the data upon which the allocation will be based (for example, logbook reports and/or vessel dimensions from the US Coast Guard documentation records). Owners or operators will have 30 days to document if any of these data are incorrect and need to be changed. The logbook submitted is the official document and cannot be changed or submitted after the due date as a basis of seeking a change in allocation. An error by NMFS in compiling the original report is a basis for change.

Once the final annual quotas for surf clams and ocean quahogs have been published by the Regional Director for any year, NMFS will calculate the number of cage tags by applying the appropriate percentages (from the individual allocation) to the annual quota for each species. These bushel allocations will then be divided by 32 (bushels per cage) to yield the appropriate number of cages for which cage tags may be issued. The cage tags are valid only for the calendar year for which they are issued. Surf clam tags may not be used on cages containing ocean quahogs and ocean quahog tags may not be used on cages containing surf clams. Clearly, it

is necessary for the Regional Director to develop tags which are significantly different between the two species, in order to facilitate enforcement.

There are no restrictions on the permissible use of the quota (that is, an owner does not have to harvest his or her share) or on the time of harvest other than it must be landed by a permitted vessel during the year for which the tags were issued. An owner may obtain a permitted vessel to harvest his or her allocation or he or she may contract for the allocation to be caught by any permitted vessel. However, the allocation may be reduced by NMFS for violations of the MFCMA.

2.3.2.3.3. Transfer of allocation permits

The ownership of an allocation may be transferred in amounts not less than 160 bushels (i.e., 5 cages) to any person eligible to own a documented vessel under the terms of 46 USC 12102. A written application must be submitted to the Regional Director specifying the number of bushels to be transferred and the new owner at least 10 days before the applicant desires the transfer to be effective. Transfers may not be made between 15 October and 31 December of each year. The transfer is not effective until the new owner receives an allocation permit from the Regional Director.

2.3.3. Effort restrictions

Fishing for surf clams and ocean quahogs is permitted seven days per week.

2.3.4. Size restriction

There is a surf clam minimum size limit of 4.75", which is the size of maximum yield per recruit. There is a tolerance of 50 undersized clams per cage. If any cage is in violation of the size limit, the entire load is in violation.

The surf clam minimum size limit may be suspended by the Regional Director on the recommendation of the Council on a year to year basis unless 30% of the clams (based on a review by the Council of discard, catch, and survey data) are smaller than 4.75" (size of maximum yield per recruit) and the overall reduced size was not attributable to beds where growth of the individual clams had been reduced because of density dependent factors. It is the Council's intent that the size limit suspension will generally be in effect when the vast majority of the surf clams were larger than maximum yield per recruit size, and the suspension will generally not be in effect when there were large numbers of small surf clams as a result of sets of large year classes. This analysis will be carried out as part of the annual quota setting process.

2.3.5. Specification and sources of pertinent fishery data

The reporting requirements continue with three changes (section 9.1). Dealers must file reports similar to those that processors must file. Dealers and processors must make their reports available for inspection by authorized officers or designated NMFS employees (the same requirement that has been in effect for vessel logbooks). The allocation permit number must be reported on both the vessel logbook reports and the dealer/processor reports.

2.3.6. Other measures

All surf clam and ocean quahog cages shall be tagged before the cable is removed from the cage on the dock and tags shall not be removed until cages are emptied at the processing plant. Information to be shown on the tags shall be determined by the Regional Director, in consultation with the Council, but will include at least the information needed to establish a chain of evidence adequate for enforcement of the surf clam minimum size limit and the vessel allocation system from the vessel through the transportation system to the processor, inclusive. The Regional Director shall determine the minimum specifications of the tags, which as a minimum shall assure that markings are not erased prior to the cages being emptied at the processing plant. Tags for surf clam cages must be significantly different from tags for ocean quahog cages, in order to facilitate enforcement.

No person shall possess a cage not containing surf clams or ocean quahogs with a tag.

No person shall possess a cage containing any surf clams or ocean quahogs without a tag before the cable is removed from the cage on the dock until the cage is emptied.

The Regional Director may allow the shucking of surf clams or ocean quahogs at sea if he determines that an observer carried aboard the vessel can measure accurately the total amount of surf clams and ocean quahogs harvested in the shell prior to shucking. Any vessel owner may apply in writing to the Regional Director to shuck surf clams or ocean quahogs at sea. The application shall specify: name and address of the applicant;

permit number of the vessel; method of calculating the amount of surf clams or ocean quahogs harvested in the shell. vessel dimensions and accommodations; and length of fishing trip. The Regional Director will provide an observer to any vessel owner whose application is approved. The owner will pay all reasonable expenses of carrying the observer on board the vessel. The observer shall certify at the end of each trip the amount of surf clams or ocean quahogs harvested in the shell by the vessel. Such certification shall be made by the observer's signature on the daily fishing log.

Based on the recommendation of the Council, the Regional Director may allow shucking at sea of surf clams or ocean quahogs if he determines a conversion factor for shucked meats to calculate accurately the amount of surf clams or ocean quahogs harvested in the shell. The Regional Director will publish a notice in the Federal Register specifying a conversion factor together with the data used in its calculation for a 30 day comment period. After consideration of the public comments, and any other relevant data, the Regional Director may publish a final notice specifying the conversion factor. If the Regional Director makes this determination, he may authorize the vessel owner to shuck surf clams or ocean quahogs at sea. Such authorization shall be in writing and be carried aboard the vessel. The observer shall certify at the end of each trip the amount of surf clams or ocean quahogs harvested in the shell by the vessel. Such certification shall be made by the observer's signature on the daily fishing log.

The Regional Director may authorize experimental fishing for surf clams or ocean quahogs in order to gather information necessary for management. Such experimental fishing will not require an allocation permit.

The Regional Director may require that vessel owners or operators notify NMFS in a manner and timing established by the Regional Director before a vessel departs the dock on a trip to harvest surf clams and ocean quahogs and before the vessel reaches the dock from a trip on which surf clams or ocean quahogs were caught.

It is the Council's intent that these management measures be implemented within two calendar quarters following approval by the Secretary.

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4. INTRODUCTION

4.1 DEVELOPMENT OF THE PLAN

The Council has been involved in surf clam and ocean quahog management since its first meeting (September 1976), when it was discussed that the surf clam fishery should be the first for which a plan should be developed. At the February 1977 meeting the Council voted to accept responsibility for the surf clam plan and began discussion of possible management measures. From April through August 1977 every meeting included a debate over possible management measures. Public hearings were conducted during June 1977, with major revisions proposed to the management system based on public comments. The original FMP (MAFMC, 1977) was approved in November 1977 for the period through September 1979. Amendment #1 extended it through 31 December 1979. It contained specific quarterly quotas for surf clams (350,000 bu each for October - December and January - March and 550,000 bu each for April - June and July - September) and an annual quota (3,000,000 bu) for ocean quahogs. The effort limitation, permit, and logbook provisions were included. The FMP (MAFMC, 1977) also instituted a moratorium in the surf clam fishery (all surf clams, since there was no New England Area) for one year to allow time for the development of an alternative limited entry system"such as a stock certificate program".

Amendment #1 (MAFMC, 1979a) extended the FMP for ninety days, until the end of 1979 (primarily to allow for completion of the latest stock assessment). It added processor reporting requirements and removed the requirement that each quarter begin with four days of fishing (even though the stock was depressed, the excess harvesting capacity led to closures very quickly. The moratorium was continued.

Amendment #2 (MAFMC, 1979b) extended the FMP through the end of 1981, divided the surf clam portion of the management unit into the New England and Mid-Atlantic Areas. Annual quotas were 25,000 bu of surf clams for the New England Area, 1,800,000 bu of surf clams for the Mid-Atlantic Area, 3,500,000 bu of quahogs for 1980, and 4,000,000 bu of quahogs for 1981. The quarterly quotas in the Mid-Atlantic Area were moving closer to equal (400,000 bu for the fall and winter quarters and 500,000 bu for the spring and summer quarters. The bad weather make up day was introduced. The moratorium was continued in the Mid-Atlantic Area.

Amendment #3 (MAFMC, 1981), approved 13 November 1981, extended the FMP indefinitely. A 5.5" surf clam minimum size limit was imposed in the Mid-Atlantic Area. The surf clam fishing week in the Mid-Atlantic Area was expanded to Sunday - Thursday from Monday - Thursday. Quota setting was put on a framework basis with ranges of 1.8 - 2.9 million bu for Mid-Atlantic Area surf clams, 25,000 - 100,000 bu for New England Area surf clams, and 4 - 6 million bu for ocean quahogs. The Council proposed a permit limitation system to replace the moratorium which was disapproved by NMFS; NMFS extended the moratorium.

Amendment #4 was initiated in response to a closure of the New England Area to surf clam fishing during the second half of 1983. On 21 July 1983 the New England Council sent a letter to the Secretary of Commerce requesting Secretarial action to reopen the New England Area surf clam fishery. The Mid-Atlantic Council passed a motion in August 1983 recommending that the Secretary not accept the proposal of the New England Council. After receiving a letter from the Secretary on 6 September 1983 denying implementation of emergency action to reopen the surf clam fishery in the New England Area, work was begun to investigate methods for avoiding an extended closure in 1984. In November 1983 the Mid-Atlantic Council passed a motion authorizing the Regional Director and the New England Council to prepare an Amendment for the New England Area involving trip limits, quarterly quotas, or similar strategies to insure fishing throughout the year. A proposed Amendment #4 was drafted by the New England Council staff in cooperation with NMFS staff and hearings were held on 21 and 22 March 1984. At a joint meeting of the New England and Mid-Atlantic Councils in May 1984 representatives of the surf clam industry from both New England and the Mid-Atlantic presented revisions to the proposed regime. The Mid-Atlantic Council passed a motion to adopt the proposed Amendment #4 to the Surf Clam and Ocean Quahog FMP as amended to provide that any unharvested portion of a bimonthly allocation be added to the immediately following bimonthly allocation rather than being prorated over all remaining bimonthly periods and that trip and weekly limits be by vessel classes based on relative fishing power using the following ratios: Class 1 = 1.0, Class 2 = 1.8, and Class 3 = 3.4, and that NMFS use a rulemaking procedure to implement the Amendment on an emergency basis. The New England Council voted at the same meeting to adopt the Amendment.

The provisions of Amendment #4 were implemented on an emergency basis for 180 days beginning 1 July 1984, during which time the Amendment was finalized by the New England Council and submitted for

Secretarial approval. However, it was determined that the document was not structurally complete for review.

Amendment #5 (MAFMC, 1984), approved 28 February 1985, allowed for revision of the surf clam minimum size limit provisions, extended the size limit throughout the entire fishery, and instituted a requirement that cages be tagged.

Amendment #6 (MAFMC, 1986) was begun in October 1984 following an exploratory fishery conducted on Georges Bank as a result of emergency regulations published 2 August 1984 (49 *FR* 30946-30948), primarily to address problems associated with the development of a surf clam fishery on Georges Bank. At its October 1984 meeting the Council voted to divide the New England Area into the Nantucket Shoals and Georges Bank Areas, the dividing line being 69° longitude. At the same meeting the Council voted to approve revising proposed Amendment #4 so its provisions applied to that portion of the New England Area west of 69° longitude.

In response to the Council's recommendation that Amendment #4 be revised to apply only to that portion of the New England Area west of 69°, the New England Council held a hearing on 11 December 1984.

At its December 1984 meeting the Council adopted the provisions of Amendment #6. The Amendment was adopted by the Council for hearings in January 1985, with hearings held 18 and 19 February 1985. The Council adopted Amendment #6 for Secretarial approval at its March 1985 meeting. At that time Amendment #4 still had not been found structurally complete. Given the relationship between the provisions of Amendments #4 and #6, the decision was made to abandon Amendment #4 and the Mid-Atlantic Council would combine the provisions of Amendment #4 with the Mid-Atlantic Council's Amendment #6 in one document. The combination of Amendments #4 and #6 did not change any substantive provisions of either Amendment.

The Council was notified via a letter of 25 July 1985 that NMFS had partially approved Amendment #6. The letter from Acting Regional Director Richard H. Schaefer to Council Chairman Robert L. Martin stated in part:

> "The measures in Amendment 6 that I disapproved are the Nantucket Shoals Area bimonthly quota guidelines and effort control measures, the one landing per day restriction applying to the Mid-Atlantic Area, the provision prohibiting the Regional Director from subdividing allowable fishing hours when the hours are set at 12 or less, and the portion of the notification provision prohibiting vessels that have fished in a notification zone from returning to fish in the same notification zone within that calendar month. The disapproval of the bimonthly guidelines for Nantucket Shoals removed the basis for adjusting the quotas between bimonthly periods when harvest either exceeds or falls short of quota. Therefore, this provision, while not specifically disapproved, can not be implemented on Nantucket Shoals at this time." (This measure was one developed jointly by the New England Council and the NMFS Northeast Regional Office.)

The Council revised Amendment #6 to replace the bimonthly quotas with quarterly quotas, eliminate the weekly landing limits for the Nantucket Shoals Area, clarify the quota adjustment provisions for the Nantucket Shoals and Georges Bank Areas, and present additional justification for the one landing per trip provision. The other disapproved provisions (prohibition on subdividing allowed fishing times under certain conditions and portions of the notification system) were deleted from the Amendment. The Amendment was approved on 9 April 1986 when the 60 day review period expired without action by NMFS.

Amendment #7 (MAFMC, 1987) was developed to change the quota distribution on Georges Bank (from 20:40:40:20 to equal quarterly quotas) and revise the roll over provisions from one period to the next. This amendment was taken to public hearings in February 1987, approved by NMFS, and final regulations published on 24 July 1987.

4.2. PROBLEMS ADDRESSED BY THE FMP

4.2.1. Introduction

An FMP for the surf clam and ocean quahog fisheries was adopted in November 1977 at a time when the surf clam resource was significantly lower than historical levels and the industry was economically unstable due to low levels of a harvestable resource. Because surf clams was the preferred species and ocean quahogs was secondary to this preference, management measures were different for each species. Since adoption of the FMP, the industry has become more integrated, ocean quahogs are a major contributor, clam product demand has changed and increased, the surf clam resource has increased. However, the harvest capacity of the fleet now requires a time limit of approximately 6 trips of 6 hours each quarter for each permitted vessel

in order to evenly space the quota over a full year and maintain a steady supply to the market. In brief, the fishery and the industry are dramatically different in 1989 than in 1977.

Although the FMP can be credited with rebuilding the surf clam stocks and contributing to an improved economic situation in the industry, capital is currently invested in vessels that can only fish 36 hours per quarter. As the FMP has evolved and been amended over 10 years, the number of regulations developed to address problems in the fishery and their complexity have increased both private and government costs.

A moratorium on new Mid-Atlantic surf clam permits has essentially frozen the fleet at its current size, but not altered the harvesting capacity of each vessel. Vessel and permit ownership transfer continues to occur, however each is static in its potential participation and value (1 vessel, 1 permit, specified hours of harvesting time) within the overall quotas. Only surf clam vessels that leave the fishery involuntarily (sinking, fire) may be replaced. No such restrictions apply to ocean quahog vessels. Mid-Atlantic surf clam vessels may obtain an ocean quahog permit, but not vice versa. However, in general, only the larger vessels can successfully fish for ocean quahogs. The New England Area is not under a moratorium on new entrants and, as such, now has over 1,100 issued permits.

4.2.2. Limited Entry in the Mid-Atlantic Area Surf Clam Fishery

4.2.2.1. History

Whether and how to limit entry into the Mid-Atlantic Area surf clam fishery has been a matter of virtually constant debate by the Council for over 10 years. However, what is clear after all of the debate, based on measures adopted by the Council and approved by NMFS, is that an absolute limit on the entry of new vessels into the fishery, that is, the moratorium, has been the Council's answer to the problem to date.

The *original* Plan (p. 65) stated:

> "A stock certificate program, an approach to limited entry, was discussed. A stock certificate program is an approach useful for attempting to insure the efficient production of the allowable harvest in a particular year in a fishery by the allocation of marketable vessel quotas. In the interim the Council has decided to freeze the number of licenses to limit further overcapitalization. The Council has decided that information on which to base an equitable stock certificate program is lacking at present."

Amendment #1 merely extended the Plan for 3 months to allow time for the completion of Amendment #2 and, therefore, did not discuss the limited entry issue.

The Council proposed a replacement of the moratorium with the beginning of a vessel allocation system in the hearing draft of Amendment #2, which was dropped in favor of an extension of the moratorium in the version of that Amendment that was adopted by the Council and approved by NMFS. The Amendment (p. 100) justified extension of the moratorium as follows: "The Council ... decided to extend the moratorium for two more years and attempt to find an acceptable replacement to the moratorium during that time. It must be recognized that the basic factors that led to the moratorium in the surf clam fishery as recommended in the original FMP have not changed. The quota remains the same. There are more vessels licensed for the fishery than were estimated to be in the fishery when the moratorium was originally proposed."

During the development of Amendment #3, both NMFS and MAFMC members questioned how long was it desirable or necessary to continue the moratorium. This led to the development of several alternatives to the moratorium in that Amendment. One was a direct vessel allocation system. Another was a permit limitation system. The second alternative was adopted by the Council in the Amendment as it was submitted to NOAA for approval. That system provided that vessels that had valid permits under the moratorium would be eligible for permits initially under the new system. A vessel was required to harvest at least 2,500 bu. of surf clams or ocean quahogs annually from the EEZ to maintain eligibility. Permitted vessels could be replaced without limit and vessels with their permits could be sold. If a vessel did not meet the harvest criterion, NMFS could not issue it a permit for the subsequent year. During the first 5 years the system was in effect, NMFS could issue 1 permit to a vessel not in the fishery for every 4 permits not reissued because the vessels did not meet the harvest criterion. After the fifth year, replacement was on a 1 for 1 basis. In addition, if a vessel did not meet the harvest criterion, the operator could appeal to NMFS that the permit should be reissued for "a hardship or special reasons".

That provision was disapproved by NMFS and to replace it NMFS produced a Secretarial Amendment extending the moratorium indefinitely. In disapproving the permit limitation system, NOAA noted that "... allowing replacement of existing vessels with any other vessel for any reason would probably lead to

significant increases in total harvesting capacity". NOAA also found the provision inconsistent with National Standard 5 "which requires that conservation and management measures shall, where practicable, promote efficiency in the utilization of fishery resources. Based on information contained in the amendment, we find that the proposed program would increase the cost of harvesting the optimum yield of mid-Atlantic surf clams, because, even if vessels leave the fishery, their potential replacements could have equal or greater harvesting capacity. The excess harvesting capacity is such that, in our opinion, an increase in the annual quota within the range that now constitutes optimum yield will not alleviate this problem but could encourage the existing vessels to increase vessel capacity through gear modifications. A continuation of tight controls over fishing hours (that is, 24 hours per week or less) seems inevitable. Also, Section 303(b)(6) of the Magnuson Act requires that the economics of the fishery be taken into account in establishing a limited access system in order to avoid the possibility that the economic efficiency of the fishery could be adversely affected. ... We believe the program does not provide for long term resolution of the serious and central problem of gross overcapitalization in the mid-Atlantic surf clam fishery and is inconsistent with the objective of the plan to 'encourage efficiency in the fishery'" (letter from William G. Gordon to David H. Hart, 11 February 1982).

Mr. Gordon, in the letter cited above, requested that the Council resolve the problem within 45 days if at all possible. The letter further stated "Although the Council is free to respond to these comments as it wishes, Section 304 of the Magnuson Act requires the Secretary to offer suggestions for improvements when a plan or amendment is not approved. I believe the disapproved portion of Amendment No. 3 could be improved sufficiently to gain approval in one of two ways. Either you could examine alternative forms of limited entry which through the marketplace or by virtue of their nature resolve the problems of efficiency and provision for new entry, or you can attempt to remove inconsistent aspects of the present proposal and provide more thorough rationale and justification of the landings requirements, replacement ratios, and other technical aspects of the proposal. In either case, your analysis of the economic and social effects of the proposal on the industry should evaluate the estimated net benefits expected to accrue from the Council's program over a free entry condition and other alternatives."

The Council considered the matter at its March 1982 meeting. On 18 March 1982, Chairman Hart wrote to Mr. Gordon indicating that the Council was willing to work cooperatively with NMFS to solve the problem but that it was not appropriate to deal with the issue in a 45 day period. Since the Council did not take action within 45 days to oppose the NMFS extension of the moratorium, the Council approved the extension of the moratorium without a time limit.

Mr. Gordon responded on 5 April 1982 "I agree with your statement that it would be inappropriate to deal with an issue of such complexity within a 45-day period. Therefore, please take the time the Council deems necessary to prepare the plan amendment."

Two conclusions follow from this review of history that are relevant to the current problem before the Council. First, while the Council has continually debated limiting entry and whether the Plan should address economic impacts and excess harvesting capacity (overcapitalization), those issues have been consistently considered and when the final vote was taken on each amendment, limited entry in the form of the moratorium was part of the management system. Second, the Council has been considering a vessel allocation system as a substitute for the moratorium and effort limitation system from the time the original Plan was being developed and, until now, had not come up with an acceptable way of making the initial allocation.

4.2.2.2. The present situation

There have been many meetings of the Surf Clam and Ocean Quahog Advisory Panel and the Council's Surf Clam and Ocean Quahog Committee to attempt to develop a solution to the problem. The essential question has been what is the best replacement for the moratorium.

The alternatives essentially amount to keeping the moratorium but calling it a limited access system while changing (perhaps significantly) some of the rules associated with the moratorium or replacing the current system with a vessel allocation system. Doing nothing also has been considered.

The vessel allocation alternative has surfaced a number of problems. From the industry standpoint, the major problem involves how the initial allocation is made, that is, who are the winners and losers under whatever formula is used. From a policy standpoint, some people feel that an allocation system amounts to giving away a public resource and that it would be better if the fishermen would be required to buy the initial allocation, but the sale of allocations by the government is not allowed by the Magnuson Act.

4.2.3. New England Area

Prior to November 1982, a "New England" EEZ surf clam fishery did not exist. Surf clams had been landed in New England for many years with the catch coming almost exclusively from State waters. Harvesting was done with vessels designed for that purpose.

The original Surf Clam and Ocean Quahog FMP (MAFMC, 1977) established a management unit of surf clams and ocean quahogs in the EEZ in the Atlantic. The management measures, including moratorium on entry of additional vessels into the surf clam fishery, effort limitations, and quotas applied to the management unit.

In response to severe pressure from the New England Council and New England interests, in Amendment #2 the Council divided the management unit into two areas, Mid-Atlantic and New England, with separate quotas and no moratorium for vessels to fish only in the New England Area. This arrangement was continued in Amendment #3, except that the maximum quota for the New England Area was increased, from 25,000 bu. to a range of 25,000 - 100,000 bu.

Amendments 6, and 7 subdivided the New England Area into two management areas with separate quotas and management systems. The portion of the New England Area west of 69° west longitude was named the Nantucket Shoals Area with an OY of 25,000 - 200,000 bushels, annual and quarterly quotas, and a framework measure allowing imposition of trip limits to minimize chances of closures. The area east of 69° west longitude was named the Georges Bank Area with an OY of 25,000 - 300,000 bushels, annual and quarterly quotas.

The NMFS permit file indicates that of the 1,192 vessels with permits to fish for surf clams in only the New England Area, only 9 participated in the fishery in 1987 (based on logbook reports).

There were considerable catches of surf clams from the New England Area during November and December 1982, and catches in 1983 were large enough to warrant the imposition of effort limitations to minimize the chances of a closure. The effort came from Mid-Atlantic based boats. As of 1 April 1983, effort in the New England Area was limited to 12 hours per week. As of 1 June 1983, the surf clam catch from the New England Area was 114,000 bu., leading NMFS to the conclusion that it would be necessary to close the fishery as of 1 July 1983.

While there is a surf clam resource of some magnitude in the EEZ off the New England States, a significant New England based EEZ surf clam fishery has not been established. The fishery in the New England Area has largely been prosecuted by Mid-Atlantic based vessels.

The New England Area was created to minimize restrictions in that area to encourage the development of the fishery. It can be argued that the fishery was fully developed as of 1 April 1983, the day that the effort limitations went into effect. Clearly, effort limitations are not needed for a fishery that is undeveloped.

Available information suggests that the EEZ surf clam resource off the New England States may presently support an OY somewhat greater than 100,000 bushels. Murawski (1986) estimated that the resource off the New England States was less than 20% of the total resource (Table 8). Surveys have found that the clams off New England are large and that there has been no significant recent recruitment, suggesting that sets in that area may be sporadic. This is logical since the area is on the northern fringe of the range of surf clams, so successful recruitment would be much less consistent relative to the Mid-Atlantic, where the bulk of the resource lies. The same situation may exist at the southern end of the range off Virginia and North Carolina. This situation (one continuous range with New England and North Carolina being the extremes) seems to indicate that separate management is not warranted for biological reasons.

The capacity of the existing fleet licensed to fish in both New England and Mid- Atlantic Areas is adequate to harvest likely quotas and combined OY, even if they were double the current Mid-Atlantic maximum. No matter what regime and OY are in effect, vessels with Mid-Atlantic Area permits have been, are, and will continue to operate under severe limitations. To continue to allow additional vessels to participate in the fishery would violate the provisions of the Magnuson Act relating to efficiency, equity, and conservation.

The National Standards Guidelines state "FMPs should include conservation and management measures for that part of the management unit within US waters, although the Secretary can ordinarily implement them only within the EEZ. The measures need not be identical for each geographic area within the management unit, if the FMP justifies the differences." Therefore, the existence of the New England Area with management measures different from those operating in the Mid-Atlantic Area does not present a legal problem if the differences are justified.

National Standard 4 states "Conservation and management measures shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be: (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges". An FMP may not differentiate among US citizens, nationals, resident aliens, or corporations on the basis of their State of residence. An FMP may not incorporate or rely on a State statute or regulation that discriminates against residents of another State. Conservation and management measures that have different effects on persons in various geographic locations are permissible, if they satisfy the other guidelines under Standard 4. An FMP may contain management measures that allocate fishing privileges if such measures are necessary or helpful in furthering legitimate objectives or in achieving the OY, and if the measures conform with the following:

1. An allocation of fishing privileges must be fair and equitable, must be reasonably calculated to promote conservation, and must avoid excessive shares.

   A. Fairness and equity. An allocation of fishing privileges should be rationally connected with the achievement of OY or with the furtherance of a legitimate FMP objective. Inherent in an allocation is the advantaging of one group to the detriment of another. The motive for making a particular allocation should be justified in terms of the objectives of the FMP; otherwise, the disadvantaged user groups or individuals would suffer without cause. For instance, an FMP objective to preserve the economic status quo cannot be achieved by excluding a group of long time participants in the fishery. On the other hand, there is a rational connection between an objective of harvesting a species at their maximum size and closing a nursery area to trawling.

   An allocation of fishing privileges may impose a hardship on one group if it is outweighed by the total benefits received by another group or groups. An allocation need not preserve the status quo in the fishery to qualify as "fair and equitable," if a restructuring of fishing privileges would maximize overall benefits. The Council should make an initial estimate of the relative benefits and hardships imposed by the allocation, and compare its consequences with those of alternative allocation schemes, including the status quo. Where relevant, judicial guidance and government policy concerning the rights of treaty Indians and aboriginal Americans must be considered in determining whether an allocation is fair and equitable.

   B. Promotion of conservation. Numerous methods of allocating fishing privileges are considered "conservation and management measures" under section 303 of the Act. An allocation scheme may promote conservation by encouraging a rational, more easily managed use of the resource. Or it may promote conservation (in the sense of wise use) by optimizing the yield, in terms of size, value, market mix, price, or economic or social benefit of the product.

   C. Avoidance of excessive shares. An allocation scheme must be designed to deter any person or other entity from acquiring an excessive share of fishing privileges, and to avoid creating conditions fostering inordinate control, by buyers or sellers, that would not otherwise exist.

An "allocation" or "assignment" of fishing privileges is a direct and deliberate distribution of the opportunity to participate in a fishery among identifiable, discrete user groups or individuals. Any management measure (or lack of management) has incidental allocative effects, but only those measures that result in direct distributions of fishing privileges will be judged against the allocation requirements of Standard 4. Adoption of an FMP that merely perpetuates existing fishing practices may result in an allocation, if those practices directly distribute the opportunity to participate in the fishery. Allocations of fishing privileges include, for example, per-vessel catch limits, quotas by vessel class and gear type, different quotas or fishing seasons for recreational and commercial fishermen, assignment of ocean areas to different gear users, and limitation of permits to a certain number of vessels or fishermen.

Each FMP should contain a description and analysis of the allocations existing in the fishery and of those made in the FMP. The effects of eliminating an existing allocation system should be examined. Allocation schemes considered but rejected by the Council should be included in the discussion. The analysis should relate the recommended allocations to the FMP's objectives and OY specification, and discuss the factors listed in this section.

In designing an allocation scheme, a Council should consider other factors relevant to the FMP's objectives. Examples are economic and social consequences of the scheme, food production, consumer interest, dependence on the fishery by present participants and coastal communities, efficiency of various types of

gear used in the fishery, transferability of effort to and impact on other fisheries, opportunity for new participants to enter the fishery, and enhancement of opportunities for recreational fishing.

National Standard 5 states "Conservation and management measures shall, where practicable, promote efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose". The term "utilization" encompasses harvesting, processing, and marketing, since management decisions affect all three sectors of the industry. The goal of promoting efficient utilization of fishery resources may conflict with other legitimate social or biological objectives of fishery management. In encouraging efficient utilization of fishery resources, this Standard highlights one way that a fishery can contribute to the Nation's benefit with the least cost to society: given a set of objectives for the fishery, an FMP should contain management measures that result in as efficient a fishery as is practicable or desirable. In theory, an efficient fishery would harvest OY with the minimum use of economic inputs such as labor, capital, interest, and fuel. Efficiency in terms of aggregate costs then becomes a conservation objective, where "conservation" constitutes wise use of all resources involved in the fishery, not just fish stocks. In an FMP, management measures may be proposed that allocate fish among different groups of individuals or establish a system of property rights. Alternative measures examined in searching for an efficient outcome will result in different distributions of gains and burdens among identifiable user groups. An FMP should demonstrate that management measures aimed at efficiency do not simply redistribute gains and burdens without an increase in efficiency. Management regimes that allow a fishery to operate at the lowest possible cost (for example, fishing effort, administration, and enforcement) for a particular level of catch and initial stock size are considered efficient. Restrictive measures that unnecessarily raise any of those costs move the regime toward inefficiency. Unless the use of inefficient techniques or the creation of redundant fishing capacity contributes to the attainment of other social or biological objectives, an FMP may not contain management measures that impede the use of cost effective techniques of harvesting, processing, or marketing, and should avoid creating strong incentives for excessive investment in private sector fishing capital and labor.

A "system for limiting access," which is an optional measure under section 303(b) of the Act, is a type of allocation of fishing privileges that may be used to promote economic efficiency or conservation. For example, limited access may be used to combat overfishing, overcrowding, or overcapitalization in a fishery to achieve OY. In an unutilized or underutilized fishery, it may be used to reduce the chance that these conditions will adversely affect the fishery in the future, or to provide adequate economic return to pioneers in a new fishery. In some cases, limited entry is a useful ingredient of a conservation scheme, because it facilitates application and enforcement of other management measures. Limited access (or limited entry) is a management technique that attempts to limit units of effort in a fishery, usually for the purpose of reducing economic waste, improving net economic return to the fishermen, or capturing economic rent for the benefit of the taxpayer or the consumer. Common forms of limited access are licensing of vessels, gear, or fishermen to reduce the number of units of effort, and dividing the total allowable catch into fishermen's quotas (a stock certificate system). Two forms (that is, Federal fees for licenses or permits in excess of administrative costs, and taxation) are not permitted under the Act. The Act ties the use of limited access to the achievement of optimum yield. An FMP that proposes a limited access system must consider the factors listed in section 303(b)(6) of the Act. In addition, it should consider the criteria for qualifying for a permit, the nature of the interest created, whether to make the permit transferable, and the Act's limitation on returning economic rent to the public under section 304(d)(1). The FMP should also discuss the costs of achieving an appropriate distribution of fishing privileges. An FMP should discuss the extent to which overcapitalization, congestion, economic waste, and inefficient techniques in the fishery reduce the net benefits derived from the management unit and prevent the attainment and appropriate allocation of OY. It should also explain in terms of the FMP's objectives any restriction placed on the use of efficient techniques of harvesting, processing, or marketing. If during FMP development the Council considered imposing a limited entry system, the FMP should analyze the Council's decision to recommend or reject limited access as a technique to achieve efficient utilization of the resources of the fishing industry. This Standard prohibits only those measures that distribute fishery resources among fishermen on the basis of economic factors alone, and that have economic allocation as their only purpose. Where conservation and management measures are recommended that would change the economic structure of the industry or the economic conditions under which the industry operates, the need for such measures must be justified in light of the biological, ecological, and social objectives of the FMP as well as the economic objectives.

The basic issue, therefore, is to determine whether the New England Area, as it presently exists and is regulated, violates the MFCMA and National Standards relative to the regime imposed in the Mid-Atlantic Area. Given the Standards relative to efficiency, equity, fairness, and conservation, is it acceptable to continue to have an area with minimal regulations and no entry limitations adjacent to a highly regulated

area with entry limitations? The New England Area was originally created to allow for exploratory fishing to help define the resource off the New England States. Given fishery performance to date and the most recent scientific information, is it efficient and equitable and in the best use of resources from a conservation standpoint to continue such a system? Is it reasonable to allow additional harvesting capacity to enter a fishery which already has a gross surplus of harvesting capacity?

Hence, it seems appropriate to consider a measure that would combine the surf clam management areas rather than measures that would continue the three existing areas. Available information shows that there is no "New England" surf clam fishery separate from the general fishery. Mid-Atlantic based vessels have made a major contribution toward the landings of clams from the Nantucket Shoals and Georges Bank Areas. With the time based management system that has operated in the Mid-Atlantic Area, vessels would fish in the Nantucket Shoals and Georges Bank Areas only if there trips were not needed in the Mid-Atlantic, or between their Mid-Atlantic Area trips. With vessel allocations replacing the time based system and the combination of allocations, many vessels will be surplus in the Mid-Atlantic and will be free to fish in the Nantucket Shoals and Georges Bank Areas if the separation is continued. This would have a negative impact on those New England based vessels that fish that area.

Enforcement of vessel allocations in one Area, trip limits in another, and no regulations except a quota in the third, when all of the clams enter the same market and vessels may fish in all three Areas would be chaos. Vessels could claim fishing in Nantucket Shoals or Georges Bank in order to catch more than an allocation. Coast Guard resources would not be adequate to track the actual fishing grounds used by each vessel.

4.2.4. Surf Clam Minimum Size Limit

The FMP currently contains a minimum size limit for surf clams. The limit could be continued, revised, or eliminated.

The minimum size limit is considered a necessary adjunct to the time based system. Under a time based system the fishermen must maximize their catch per unit of time in order to maximize their incomes. They cannot take the time to hunt for beds of larger clams even though the larger clams command a higher price. Hence, some protection against excessive harvest of small clams is necessary.

Under an allocation system, time is no longer a constraint. Since vessels would be allocated a fixed number of cages per year, fishermen theoretically would attempt to maximize the value of those cages by catching the largest clams possible.

It may be appropriate to provide for a size limit under some circumstances so as to enhance protection of the resource when necessary while minimizing regulations when possible.

4.2.5. Effort Limitations

The current FMP contains effort limitations in two forms. There is a mandatory system for the Mid-Atlantic Area surf clam fishery whereby the NMFS Northeast Regional Director must set effort limits in terms of hours per week, month, or quarter during which fishing for surf clams may occur. This system may be implemented in the ocean quahog fishery coastwide after half of the annual quota has been harvested (a provision that has never been applied). In the Nantucket Shoals Area surf clam fishery there is a provision to introduce vessel trip limits if the Regional Director believes such limits are necessary. In all cases the explicit objective is to minimize the chance of closure, that is, make the quota last through the quarter or year.

The alternatives are to either leave these provisions in the FMP or remove them.

If the existing time system remains in effect, then, by definition, the effort limitations would remain in effect. With a direct allocation system the market could determine the harvesting rate. The trip limit system, under which vessel allocations are in the form of individual vessel trip limits, by definition requires an effort limitation system because the government must control the number of trips to keep the catch within quota.

However, effort limitation systems tend to increase harvesting costs since a vessel may only fish in accordance with the regulations, which may not allow a given vessel to optimize its harvesting strategy.

Additionally, effort limitation measures require enforcement at sea, which is more expensive than shore based enforcement and may be more difficult to achieve, given the limitations on enforcement platforms (cutters and aircraft).

4.2.6. Ocean Quahog Management

Effort directed toward ocean quahogs has been increasing, in terms of the total catch and number of vessels fishing for both surf clams and ocean quahogs. The quahog catch is approaching the maximum Optimum Yield limit. The issue, for purposes of this Amendment, is whether quahog management should be revised to match the revisions to surf clam management in order that the problems experienced over the years with surf clam management are not repeated with ocean quahogs.

For years the Council's Scientific and Statistical Committee has been recommending that the surf clam vessel moratorium be expanded to ocean quahogs.

In 1987 there were a total of 71 vessels reporting landings of ocean quahogs, up from 37 in 1983 and 64 in 1985. The vast majority of these increases represent surf clam vessels which started catching quahogs to supplement their incomes, for the number of vessels reporting landings of only quahogs (and no clams) is down to 3 vessels in 1987, from a high of 14 in 1984.

4.3. MANAGEMENT OBJECTIVES

The revised objectives of the Atlantic Surf Clam and Ocean Quahog Fishery Management FMP are:

1. Conserve and rebuild Atlantic surf clam and ocean quahog resources by stabilizing annual harvest rates throughout the management unit in a way that minimizes short term economic dislocations.
2. Simplify to the maximum extent the regulatory requirement of clam and quahog management to minimize the government and private cost of administering and complying with regulatory, reporting, enforcement, and research requirements of clam and quahog management.
3. Provide the opportunity for industry to operate efficiently, consistent with the conservation of clam and quahog resources, which will bring harvesting capacity in balance with processing and biological capacity and allow industry participants to achieve economic efficiency including efficient utilization of capital resources by the industry.
4. Provide a management regime and regulatory framework which is flexible and adaptive to unanticipated short term events or circumstances and consistent with overall plan objectives and long term industry planning and investment needs.

4.4. MANAGEMENT UNIT

The management unit is all surf clams (*Spisula solidissima*) and all ocean quahogs (*Arctica islandica*) in the Atlantic EEZ.

5. DESCRIPTION OF THE STOCK

5.1. SPECIES DISTRIBUTION

5.1.1. Surf Clams

The surf clam is one of the largest bivalves living on the continental shelf of eastern North America and is distributed from the southern Gulf of St. Lawrence to Cape Hatteras. A much broader latitudinal range, through the Gulf of Mexico was given in Merrill and Ropes (1969), but there is evidence that the populations south of Cape Hatteras are actually a distinct subspecies (Jacobsen and Old, 1966). Commercial concentrations are found primarily in sandy sediments off New Jersey and the Delmarva Peninsula (Figure 1), although some fishable quantities exist in southern New England waters and on Georges Bank (Figures 2 and 3).

Surf clams are predominantly oceanic, most common in turbulent waters just beyond the breaker zone (Ropes, 1980). Encroachment into estuarine zones is probably limited by salinity requirements (Fay *et al.*, 1983) Surf clams are generally found from the beach zone to a depth of about 200 ft; beyond 130 ft, however, abundance is low (USDC, 1988a).

5.1.2. Ocean Quahogs

Ocean quahogs are found on both sides of the North Atlantic Ocean. Distribution ranges from Newfoundland to Cape Hatteras in depths from 30 ft to 800 ft in the western Atlantic. Quahogs are rarely found when bottom water temperatures exceed 60° F and thus occur progressively further offshore between Cape Cod and Cape Hatteras. Highest densities in the Mid-Atlantic region are between 130 ft and 200 ft; few

quahogs have been found in the Mid-Atlantic in excess of 300 ft (USDC, 1988a). Medcof (1958) has reported large stocks in the Southern Gulf of St. Lawrence; other major areas of concentrations have been reported along the coasts of Scandinavia, Greenland, and Newfoundland (Parker and McRae, 1970). Rowell and Chaisson (1983) described the abundance and distribution of ocean quahogs in the Canadian Maritimes. Ocean quahogs are present on much, if not most, of the continental shelf of North America.

Some information is available on environmental conditions influencing the distribution of ocean quahogs. Turner (1949 and 1953) believed that temperature may be the factor influencing the depth zonation of the species. Intolerance to high temperatures probably explains its absence from shallow water in the southern part of the range (Merrill *et al.*, 1969).

5.2. Abundance and Present Condition

5.2.1. Surf Clams

Total surf clam landings have continued to increase from a 1979 low of 35 million lbs of shucked meats to 79 million lbs in 1986 (Table 1). In 1987, total landings decreased 23%, to 61 million pounds, supposedly because there was an abundance of product from the previous year in storage (section 7). Landings from the EEZ increased 90% between 1979 and 1986 (Table 2). The proportion of total landings taken from the EEZ during 1987 was 80%. New Jersey has always had the largest amount of inshore (State) surf clam landings (Table 3) but New York had major landings in 1985 and 1986 also. Landings from inshore waters increased 60% between 1984 and 1986, but returned to more traditional patterns in 1987 (Table 2). Landings and the associated effort are fully described in Chapter 7.

Research vessel surveys of the Mid-Atlantic surf clam resource were generally conducted annually beginning in 1965, however since 1985 the surveys have been conducted every other year. No surveys were conducted in 1987. Commercial type hydraulic clam dredges, modified to retain pre-recruit sizes, have been used as survey gear. Indices of abundance (number of clams per tow) are adjusted to reflect differences in the dimensions of gear and operational procedures employed. Survey strata are grouped into sets corresponding to the geographical boundaries of the principal EEZ fishery areas (Georges Bank, Southern New England Long Island, Northern New Jersey, Southern New Jersey, Delmarva, and Southern Virginia - North Carolina; Figure 4). Limited research surveys of the surf clam resource in New England waters have been conducted since the late 1960s.

Between 1969 and 1982 NMFS performed 219 sample tows in the Nantucket Shoals Area for surf clams (Murawski and Serchuk, 1983a). This area has been sampled less frequently in the past than the Mid-Atlantic because of rugged bottom topography, sporadic distribution of beds, and lack of commercial fishing interest.

In 1984 and 1986 research surveys of the surf clam resource on Georges Bank were conducted.

From mid-June through mid-July 1986 NMFS randomly sampled 334 stations between Georges Bank and Albemarle Sound during their surf clam/ocean quahog survey. Eighty four stations were sampled in the Nantucket Shoals/Georges Bank Area and 250 stations were sampled in the Mid-Atlantic Area. One hundred and three (41%) of the 250 Mid Atlantic stations had no catch of surf clams. Forty six of the 250 stations (18%) had clams in "commercially harvestable" quantities (40 or more clams per tow). Thus, 40 percent of the Mid-Atlantic stations had some surf clams but not in high enough concentrations to currently warrant economic exploitation. It must also be remembered that many of the no catch and low catch stations did have concentrations of ocean quahogs (section 5.2.2). Although the extrapolation of these sampling data to the entire region may have limitations (that is, extremely large variabilities and distribution of stations somewhat allocated by importance to fishermen) the comparisons among years are valid and informative.

The 1982, 1983 and 1984 NMFS stratified indices (mean weight) for Northern New Jersey were the highest recorded (Table 4) during the 22 year time series. However, there has been a decreasing trend in the mean weight indices from 1982 through 1986. The current indices for Southern New Jersey are about one third of those for Northern New Jersey, but nearly all the clams are of large size (more than 5.5"; Table 5). Delmarva was similar to Northern New Jersey with many (index of 105) smaller clams (Table 6). Abundance has decreased in Southern Virginia-North Carolina from January 1980 (87 to 21) while the percentage (number) of large clams increased from 1% to 22% (Table 7). If weight of clams is considered rather than numbers, then 48% of the Northern New Jersey resource, 94% of the Southern New Jersey resource, and 19% of the Delmarva resource is comprised of large clams (Tables 4-6). The NMFS survey estimates of relative abundance from the four survey areas have become variable in recent years (Tables 4-7), primarily as a result of the highly aggregated nature of the distribution of individual year classes.

The Long Island, New York area is part of the Mid-Atlantic Management Area as defined for surf clams. The New York EEZ surf clam resource supports only very limited surf clam harvesting. From the 1986 survey, this area accounts for less than 1% of the EEZ surf clam resource in both numbers and biomass (Table 8).

Overall, in 1986 the Delmarva area had half the total estimated surf clam resource by weight and 56% by number (Table 8). The Northern New Jersey survey area had the second largest amount of the resource by weight and was tied with the Georges Bank area for the second highest percent of the resource in numbers. However, the numbers per tow are nearly twice as much (46 vs 27) in Northern New Jersey as they are in Georges Bank and thus, simply the economic features of the cost associated with effort do not make the two areas equivalent for fishing.

The surf clam resource in southern New England (according to these 219 sample tows) is located at the periphery of Nantucket Shoals (Figure 2), which is an area difficult to survey and fish. The mean catch per tow (Table 9) among the sampling strata in the Nantucket Shoals area is highly variable and because of the limited number of sample tows, comparisons across years cannot be performed.

Research surveys performed by the Northeast Fisheries Center (NEFC) in New England waters during 1980-1983 were localized in the southern half of Georges Bank to evaluate ocean quahogs abundance. Low level sampling in the central and northern portions of Georges Bank confirmed the distribution of surf clams in these regions, although the survey data were not sufficient to perform a reliable stock assessment of the surf clam resource. The rapid development of the Georges Bank surf clam fishery during 1984 necessitated a direct research program to provide adequate information about the extent of the stocks to facilitate rational management of the fishery. During most of 1984, the Georges Bank surf clam fishery was conducted under authority of a research exemption which allowed the fishery to proceed without quota, effort, or clam size regulation but which required that participants collect biological data and conduct exploratory fishing (Murawski and Serchuk, 1984b).

A research vessel survey of the Georges Bank area was conducted during 25 July - 1 August 1984 using standard clam surveying procedures (Murawski and Serchuk, 1984b). Average catch per tow values varied considerably among survey strata (Table 10). Stratum 67 (the Cultivator Shoals region) exhibited the highest catch rate of the strata sampled. Moderate densities of clams were apparent in Strata 65 and 72. Average catch rate (Table 11) for all research vessel survey data combined (1980-1984) were not substantially different from the 1984 data taken separately (Table 10).

A distribution plot (Figure 3) of all research vessel survey data indicates the high density area on Cultivator Shoals as well as intermittent large clam catches to the northeast. Another concentration of clams is indicated just east of Cultivator Shoals. Although some surf clams are apparently distributed over a wide area on the Bank (Figure 3), fishable concentrations appear to be mostly confined to the northern portion of the Bank. The recently determined US-Canada boundary in the Georges Bank region is plotted along with the distribution of survey catches from the area.

A relative abundance index for surf clams in the Southern New England (Nantucket Shoals) region was computed from survey catch data and compared with other clam assessment areas in the Mid-Atlantic Bight. The Southern New England region accounts for approximately 16% of the area surveyed for clams. An estimated 3% of the total surf clam number and 5% of the total clam resource in weight occurred in the Southern New England region (Table 8). The Southern New England region contained large surf clams, with 91.6% of the clams in the survey equal to or larger than 5.5".

The Georges Bank Area accounts for 23% of the area surveyed in 1986 and contained 16.5% of the surf clam resource (in numbers) and 13.5% of the resource in weight (Table 8). The areas surveyed off Long Island accounted for 12% of the area, 0.6% of the resource in numbers and 0.9% of the resource in weight. For purposes of comparison, the Northern New Jersey region had 13% of the area and 16.5% (numbers) and 21.2% (weight) of the resource; Southern New Jersey accounted for 5% of the area and 2.5% (numbers) and 5.3% (weight) of the resource; the Delmarva region had 20% of the area and 56.2% (numbers) and 50.0% (weight) of the resource; and the Southern Virginia-North Carolina region accounted for 11% of the area and 4.9% (numbers) and 4.3% (weight) of the resource. Unfortunately, in 1986 the majority of the resource in the Delmarva region was still less than 5" (Table 8).

Although tremendous variability and uncertainty exists concerning the absolute size of pre-recruit and recruited resources off New Jersey, Delmarva and Southern Virginia-North Carolina, it is probable that the strong 1976 and 1977 year classes (Figure 5) can be shepherded through wise management to support the fishery for at least the next 10 years. This 10 year time frame has been selected to provide stability to the

fishery rather than allow catch levels to rise and fall significantly as clams are fished out over time or recruit to the fishery.

5.2.2. Ocean Quahogs

Harvesting of ocean quahogs was initiated during World War II off Rhode Island. Total landings, however never exceeded 4 million lbs of shucked meats until 1976 when offshore exploitation began off New Jersey and Maryland (Table 2). Steady declines in offshore surf clam stocks combined with the massive kill of surf clams off New Jersey in 1976 stimulated fishing for the deeper dwelling ocean quahog. Landings in 1987 of ocean quahogs were 50 million lbs of meat with nearly all of the landings coming from the EEZ (Table 2). Total ocean quahog landings increased dramatically between 1975 and 1979 (1 million to 35 million lbs of meat) but stabilized and averaged 35 million lbs between 1979 - 1983 with 95% coming from the EEZ (Table 2). Rapid growth in landings have occurred in the past three years. Most of the EEZ landings are from off New Jersey, and the remainder from the Delmarva Peninsula. Small quantities of quahogs were also landed from state waters off Rhode Island and Maine.

Survey abundance indices were developed for six assessment areas off the northeastern USA: Southern Virginia-North Carolina (SVA-NC), Delmarva (DMV), New Jersey (NJ), Long Island (LI), Southern New England (SNE), and Georges Bank (GBK). These survey results are essentially the same as indices developed from combined survey results for 1980-1982 (Table 12).

Catch per tow at length for both surveys indicated no significant changes in resource abundance for these two regions as a whole, although slight growth as evidenced by a right hand shift of length frequency modes between the 1980-1982 and 1986 surveys is indicated for each area (USDC, 1986).

Minimum biomass estimates were calculated by expanding the average catch per tow values (in meat weight) for each area by the area swept by an average dredge tow (0.0001069 square nautical miles), then multiplying by the area surveyed corresponding to the catch per tow index in each assessment area. Again, these calculations are very consistent with similar analyses from 1980-1982 surveys (Table 12).

The total minimum population estimate for all six areas combined was 3% less for the 1986 survey than the 1980-1982 value. Considering that the 1986 clam survey evaluated about 7% less area, the survey abundance indices between years were not significantly different (Table 12). The proportions of total resource biomass in each area also changed little between surveys.

Current harvest quotas for the EEZ ocean quahog fishery (60 million pounds of meats) are approximately 2% of the minimum biomass estimate for the six assessment areas evaluated during NEFC surveys. Considering this low relative exploitation rate, total resources will remain stable for the next several years, although the distribution of fishery landings remains very much different than that of the resource as a whole. The 1986 survey revealed no significant increases in ocean quahog recruitment to any assessment area, thus in the long term, stock biomass in areas currently being exploited (New Jersey and Delmarva) will doubtlessly be reduced (USDC, 1986).

5.3. STOCK CHARACTERISTICS AND ECOLOGICAL RELATIONSHIPS

5.3.1. Spawning and Early Life History

Both surf clams and ocean quahogs are heterosexual, although hermaphrodism has been reported in surf clams (Ropes, 1968). Male and female clams and quahogs are identical in external appearance, and histological sectioning and examination of gonads is the only sure way to determine gender.

Male and female surf clams reach sexual maturity during their second year, even though ripe gonads and some spawning activity may occur in one year old clams (Ropes, 1979). Sexual maturity in ocean quahogs is reached by age eight for half the males and age 11 for half the females (USDC, 1988a). No observations on fecundity of surf clams (Fay *et al.*, 1983) or ocean quahogs are available.

Spawning in surf clams has been reported to occur both during a single time and over multiple periods from mid July through early November (Fay *et al.*, 1983). Within a bed of clams, spawning is probably a synchronous annual event (Ropes, 1968). Water temperature is an important factor influencing initiation and time of spawning (Ropes, 1980), and may also influence the rate of gonadal ripening and number of major spawning periods per year. After eggs and sperm are broadcast, fertilization occurs in the water column above the spawning bed of clams (Murawski and Serchuk, 1981).

Spawning in ocean quahogs occurs over a prolonged period from May through November with spawning activity being most intense from August through November (Mann, 1982). Multiple annual spawnings at

both the individual and population level occur. After an assessment of the hydrographic conditions in the area, Mann (1982) hypothesized that larval survival is probably greatest during the months of October and November, which is the breakdown of the intense seasonal thermocline and before the onset of low winter seawater temperatures.

Eggs and larvae of both surf clams and ocean quahogs are planktonic and water currents in areas inhabited are important in determining eventual patterns of distribution and settlement for developing juveniles. Dispersal and redistribution of surf clams to other areas, through swimming and crawling activities and water currents, occur primarily during the larval stages. The generalized surface water layer circulation between the Gulf Stream and the East Coast (that is, the area inhabited by surf clams and ocean quahogs) is a southerly flow (Figure 6), so that planktonic eggs and larvae generally would be drifting from north to south. Specific information, however on the interaction of water currents and larval settlement patterns is unavailable (Ropes, 1980).

5.3.2. Growth and Size Composition

5.3.2.1. Surf clams

The stratified mean catch per tow indices (Tables 4-7) indicate large increases in surf clam abundance in Northern New Jersey and Delmarva which are attributable to a strong 1976 year class in Northern New Jersey and a strong 1977 year class in Delmarva (Figure 5).

While surf clam resources in the Mid-Atlantic EEZ continue to be dominated by the strong 1976 and 1977 cohorts, subsequent year classes appear to be relatively weak. Survey sampling during 1978 - 1986 have failed to document any additionally strong year classes spawned after the 1977 cohort off Delmarva. Although the historical periodicity of good recruitment occurring in EEZ populations is unknown, the lack of significant spawning since 1978 and the long period between spawning and recruitment (7 years) implies that the 1976 and 1977 year classes will have to support the fishery until at least the middle of the next decade.

The average Delmarva clam shell length is slightly larger at each age for ages 2 through 10 than is its New Jersey counterpart (Figure 7A). While the mean shell lengths for EEZ New Jersey clams are slightly smaller than comparably aged Delmarva clams, the mean meat weight of New Jersey surf clams is significantly more than Delmarva individuals (Figure 7B). Assuming the relationship between age and shell length presented by Serchuk and Murawski (1980), average individuals in both areas became legal sized clams by their sixth year (Table 13).

There is evidence that suggests the age-length relationship developed by Serchuk and Murawski (1980) may not be totally valid for all areas populated by the 1976 and 1977 year classes. The growth rates seem to have declined significantly in areas of very high clam densities. According to NMFS 1983 research survey some of the highest clam densities (that is, 1,955 and 710 clams per tow) occurred in the Atlantic City and Chincoteague closed areas. Haskin (1984, pers. comm.) developed growth curves which differ significantly based upon the density and water depth (Figure 8). Calculating the mean size of clams from the 1976 cohort in Northern New Jersey yields a mean projected shell length of 4.8" in August 1981, 5.2" in August 1982, and 5.5" in August 1983. Examining Haskin's extensive (over 100 tows annually per 120 square n mi area) survey of the Atlantic City closed area produces a mean shell length of 4.6" in August 1981, 5.0" in August 1982 and 5.1" in August 1983. Consistently, the measured mean shell length in the closed area is less than the projected rate for the entire region. This density dependent growth phenomenon may appear real but at present is not fully quantified.

Due to the persistent question of whether surf clam growth is at all influenced by their concentration, a brief analysis of the closed area data was performed in order to find any evidence to support or refute this hypothesis.

The measure of density was simply bushels per tow, which should be directly related to the concentration of clams on the sea floor. The methodology consisted of sorting each station in a given area into density classes as follows: Class 1 = 0.0-2.0 bu, Class 2 = 2.1-5.0 bu, Class 3 = 5.1-10.0 bu, Class 4 = 10.1-20.0 bu, Class 5 = 20.1-30.0 bu, Class 6 = 30.1-40.0 bu, Class 7 = 40.1-60.0 bu, Class 8 = 60.1+ bu. This was repeated for every year an area was surveyed. The results of this procedure revealed that Ocean City had too many empty cells for a meaningful analysis. Chincoteague had sufficient cells empty that the density classes had to be combined into three broad density levels: Level 1 = 0.0-5.0 bu, Level 2 = 5.1-30.0 bu, and Level 3 = 30.1+ bu.

There is a large separation between less dense concentrations of clams and the mean annual size for both the Atlantic City and Chincoteague closed areas (Figures 9A and 9B) with the exception of one point (in Atlantic City in 1983 when Density Classes 1 and 3 cross), the mean size for lower density classes lie above those of succeedingly higher density. Within a year, there is a consistent downward trend in mean length as the density increases (Figures 10A and 10B).

The caveats of this analysis and methodology must be stressed. One may assume this analysis proves that when surf clams are more spread out, they experience less competition for food and space and thus experience higher growth. However, another factor may be involved but which has not been controlled for: distance from shore. Both Chang *et al.* (1976) and Jones *et al.* (1978) found that surf clams in the deeper, colder, waters farther from shore experienced faster growth and lived longer than those sampled from relatively shallow inshore sites. In the brief analysis conducted thus far, all stations of a similar density were grouped together regardless of distance from shore. Thus, what may be happening is that stations with lower density and higher growth also happen to be further from shore, with the dominant factor (if there is one) left uncertain. To answer the question more conclusively would require examining the growth at stations which were the same distance from shore (and perhaps depth as well), but of varying density.

Nantucket Shoals Area surf clams are large in comparison to those in the Mid-Atlantic Area with an average size of about 6.5" and ranging from 5.75" to 7.5". In 1983 this population was dominated by clams 7-10 years old with relatively recent poor recruitment. Nantucket Shoals clams appear slightly faster growing than their Mid-Atlantic counterparts, and have meat yields which are slightly greater for similar sized clams (Murawski and Serchuk, 1983a).

Size frequency distributions of clams collected on Georges Bank in 1984 and sampled both by observers at sea and from landings exhibit a pronounced mode at 5.9-6.3" shell length (Table 14). Ageing analyses performed on three commercial samples of Cultivator Shoals clams revealed that most individuals were nine years old (1975 year class). Mean shell length at age for this cohort (6.1 in. for age nine during July 1984) was nearly equal to that expected in Middle Atlantic populations (Table 13).

A total of 610 clams obtained from the research vessel survey of Georges Bank during 1984 were utilized in age/growth studies. Age analyses revealed 20 different age classes on Georges Bank, with the majority of clams in the 4 to 5 and 8 to 9 year old groups. Growth rates for shallow areas (less than about 180 ft) were similar to long term growth rates exhibited by Middle Atlantic surf clam populations. Several areas along the northern portion of the Bank (mean depth 180 feet) exhibited distinctly slower growth rates than shallower areas. However, these areas exhibiting slower growth did not represent a large proportion of total clam biomass on the bank.

5.3.2.2. Ocean quahogs

Longevity is an interesting recent discovery about the ocean quahog. One probably lived for 225 years, making it the longest lived, slowest growing, bivalve yet known (Brownlow and Ropes, 1984). Recent age and growth studies based on external and internal growth markings (Jones, 1980; Murawski *et al.*, 1980; Thompson *et al.*, 1980) and mark-recapture techniques (Murawski *et al.*, 1980) have assessed the ages of ocean quahogs. Quahogs larger than 3.5" shell length, common in NMFS survey catches in the mid-Atlantic, are estimated to be 70 years or older.

Little size selectivity by the fishery is apparent as the size composition of landings is similar to that from resource surveys of the exploited areas (Murawski and Serchuk, 1983b). Average 1980 - 1982 size compositions of quahog landings were compared to size data from corresponding resource surveys in the areas actually being fished (Figure 11). Survey size distributions were nearly identical to those in the fishery, indicating little commercial culling. Also significant was the general lack of small quahogs (less than 2.5") in the areas being fished.

Based upon size composition data (Figure 11) and the age-size relationship (Figure 12) it is apparent that a significant proportion of the quahog population is in excess of 100 years old. Assuming an average shell size of 3.8"(97 mm) at age 100, then at least 17% of the New Jersey resource and 16% of the Delmarva resource are in excess of 100 years (Murawski and Serchuk, 1983b). Since quahogs from 2.5 to 4" comprise the bulk of the resource, these are individuals were spawned 20 to 100 years ago.

5.3.3. Yield Per Recruit and Mortality

5.3.3.1. Surf clams

Population growth parameters in the past have been significantly different between New Jersey and Delmarva surf clams and thus warrant separate yield per recruit (YPR) analyses (Serchuk and Murawski, 1980). The YPR analyses were performed on both populations by varying the instantaneous fishing mortality (F) between 0.1 and 2.0 (Figure 13) and examining five minimum sizes at entry into the fishery (4.50", 4.75", 5.00", 5.25", and 5.50").

For both populations, maximum YPR occurs at an instantaneous fishing mortality rate of 2.0 (Table 15). This unrealistically high instantaneous rate (corresponding to an annual rate of 0.86) results from the shape of the YPR curve; the curve is asymptotic with the right hand segment becoming nearly flat as fishing mortality increases (Serchuk and Murawski, 1980). Approximately 95% of maximum YPR is achieved at F = 0.75 in each of the EEZ surf clam populations. The $F_{0.1}$ (the fishing mortality rate at which the additional catch produced by one additional unit of effort is only 10% of the catch produced by the same unit of effort in a new fishery) value (0.35) is approximately 90% of the maximum YPR on a long term basis from both area resources.

Although the YPR analyses of the Delmarva and New Jersey populations show similar trends, the absolute value of YPR (in grams of meat weight) is slightly greater for the more northern area (Table 15). In general, the Delmarva area population will yield 2 or 3 grams less meat per recruit for any given fishing rate and harvest size.

Overall, the maximum YPR occurs at 4.75". Further growth of clams beyond this size is offset by loss of clams due to natural mortality. The YPR for a 5.0" minimum size is approximately equal that at 4.75".

Although maximum YPR values were generally realized at F levels near 2.0, such intense fishing levels would have serious impacts on the age composition of the spawning population and on total reproductive potential. At relatively high F values, few clams greater than 5.0" survive to spawn. Although 5.0" clams have typically spawned 3 times (Table 16), the proportional contribution of spawning products by these clams is considerably greater than those of smaller (younger) individuals. Moderate F levels may also be desirable to maintain a heterogeneous age distribution in the spawning population as a buffer against successive poor year classes (Serchuk and Murawski, 1980).

Haskin and Wagner (1986) conducted research directed toward assessing mortalities in surf clams attributable to dredging, sorting and discarding. The study demonstrated that transplanting surf clams is not currently feasible since minimal transplant mortality estimates of at least 50% confirm an earlier study where approximately 55% of clams failed to survive transplantation (Haskin and Starypan, 1976). The study concluded that even with careful handling and skilled captains, minimal dredging mortalities will approach 20%. On-deck sorting with steel rollers will kill almost another 20%. Additional stress caused by holding the clams on the deck and shoveling them over can add nearly another 20% mortality. The study also confirmed (although limited in the evaluation of bottom sorting effort) the high mortality rates (30-92%) reported by others in surf clams left behind in the dredge path. These high mortality rates for clams left behind, coupled with the failure of the adjustable dredge to release sub-legal clams in this study, lead the authors to conclude that bottom sorting is not currently a substitute for on-deck sorting.

5.3.3.2. Ocean quahogs

Yield per recruit analyses were performed to evaluate the effects of various harvesting rates and sizes (ages) at entry on the yield potential in the EEZ quahog fishery (Murawski and Serchuk, 1983b). Growth and natural mortality parameters used in these analyses were based on population dynamics studies (Murawski and Serchuk, 1979; Murawski, *et al.*, 1980).

Separate YPR analyses were conducted for the New Jersey and Delmarva areas since length-weight relationships for these areas differ (Figure 12). Age at recruitment was assumed to be 12 years (equivalent to 50 mm shell length); four ages at first selection (t_c) by the fishery were evaluated (12, 17, 28, and 45 years, equivalent to 50, 60, 70 and 80 mm shell length).

For instantaneous natural mortality rates (M) of 0.01 and 0.02, and an age at first selection of 12 years, YPR is maximized in both New Jersey and Delmarva resources at F values between 0.03 and 0.05. When age at first entry is increased between 17 and 45, YPR is maximized at F levels above 0.03. At comparable F, M, and t_c values, YPR in Delmarva area (Table 17), is slightly greater than in New Jersey, due primarily to the greater mean weight at age of Delmarva quahogs.

If the minimum age at entry is assumed to be 12, yield potential of cohorts will be maximized at F values between 0.03 - 0.05. For t_c = 17 years, YPR is maximized at F = 0.03 - 0.07. These results can be used to derive an estimate of the percentage of the resource that could be harvested on an annual basis (utilization rate, U) to achieve YPR maximization. The utilization rate corresponding to particular F and M combinations can be computed from: U = (F)(A)/Z, where A is the annual mortality rate, and Z is the sum of F and M (instantaneous total mortality rate).

Maximum YPR is achieved for an age at entry of 12 years at utilization rates of 1.0 -4.8% (assuming M = 0.01 - 0.02). If age at entry is increased to 17 years, the corresponding range of utilization rates resulting in maximum YPR is 1.0 -6.7%. Differences in absolute YPR are, however, relatively small between the two age at entry values for Fs between 0.03 - 0.07.

If the minimum age at entry is assumed to be 28 - 45 years (or about 70 - 80 mm shell length) utilization rates corresponding to maximum YPR, range between 3.9% and greater than 9.4%.

5.3.4. Ecological Relationships

5.3.4.1. Feeding

Feeding is intimately related with the currents of water drawn in through and expelled from the siphons for respiratory and excretory purposes, since the water may carry food particles eventually ingested by the organism. Leidy (1878) made observations on the contents of the digestive tract of surf clams from a New Jersey beach. He was surprised "at the number of different genera and species of diatoms found" but mentioned only *Amphiprora constricta* and a suspected ciliated infusorian *Tintinnus*. Feeding both these species in culture facilities involves a wide variety of mixed plankton cultures.

5.3.4.2. Competitors

A variety of benthic organisms occur in the beds with surf clams and ocean quahogs. It is not known how these may compete, but most would utilize space in the bottom, form a smothering mat over it, or utilize the available foods.

5.3.4.3. Predators

Moon snails, crabs and starfish have all been recognized as predators of clams. Fish, cod and haddock, have been reported (Clarke, 1954) to have stomachs that have contained clams. Several European studies report a variety of invertebrate predators of mactrid species and are summarized in Ropes (1980). While there are various known predators for similar species of bivalves, relatively few have been identified specifically for surf clams and ocean quahogs. The effects of predation on survival of newly settled juvenile spat for both species however, may be very significant (Ropes, 1980).

5.3.3.4. Diseases

Protistan organisms, larval trematodes, larval cestodes, and tumors are among known parasites and diseases of marine commercial clams (Sindermann and Rosenfield, 1967).

5.4. ESTIMATE OF MAXIMUM SUSTAINABLE YIELD AND AREAL EXTRACTION RATE

5.4.1. Surf Clams

The estimate of maximum sustainable yield (MSY) in the original FMP was 2.9 million bu (approximately 50 million lbs of shucked meats) over the range of the resource, which was based upon commercial landings from 1960-1976. This value is problematic for several reasons: 1) it is based on an historical average catch for a period of years when the surf clam populations were in a substantial state of flux, 2) it included landings from the inshore areas not regulated under the plan, 3) it does not include provisions for resources in areas such as Nantucket Shoals and Georges Bank, that began contributing to the landings after the period considered for the long term average catch, and 4) it is not clear that average catch values, taken for any period, represent the "long term potential catch" from a stock.

Although the concept of maximum sustainable yield certainly does not apply in the true equilibrium sense to stocks such as surf clams that exhibit substantial inter-annual variability in recruitment, there is nevertheless the ability in stocks with low natural mortality rates to "stock pile" fishable biomass, and thereby buffer the effects of highly stochastic recruitment (USDC, 1987a). The USDC (1987a) document described a probabilistic approach to the definition of MSY through an analytical model which examined various constant catch scenarios in terms of the ability of the stocks to support exploitation. The problem of MSY for the stock was

thus cast as one of determining the maximum constant catch, subject to the risks inherent in reducing the stock to levels at which the specified catch could not be taken.

A stochastic simulation model was constructed to simulate the dynamics of surf clam populations under various constant catch strategies (USDC, 1987a). The model incorporated provisions for very infrequent but strong year classes (as observed in the mid-Atlantic region). Various population data (mean weight at age, natural mortality rate, partial recruitment vector, partial maturity vector) as well as information on the expected frequency and amplitude of recruitment, and the specific harvest strategy to be simulated were incorporated. The recruitment process was simulated by a multi-modal frequency distribution: the frequency of recruitment was first determined as "good" or "bad", based on a specified probability (in mid-Atlantic simulations the frequency of "good" year classes was set at 5%, or a 1 in 20 chance). In order to keep the simulation from crashing, the maximum allowable F in any year was set at 3.0 (or a 95% annual harvest rate). The simulation then used an iterative technique to solve for the F level giving the specified catch, and the catch equations were used to solve for stock size, catch, and to update the populations for the next year of the simulation. At the end of simulation, distribution statistics were computed for F, catch, spawning stock size, and total stock size. Also, the proportion of years in which the population was not sufficient to give this specified constant catch was also computed.

The results of various simulations produce very widely different scenarios depending upon the constant catch assumptions (Table 18). It is apparent from these preliminary simulations that as constant catch is increased above 55 million lbs, the frequency of years in which the stock is not capable of supporting the constant catch increases dramatically. Also, the mean F level increases 50 fold, and the coefficient of variation (CV) in stock size and catch increases with increasing catch. It is clear that at levels in excess of 55 million lbs (Figure 14), that the stock does not buffer the effects of variable recruitment, and the variability in the underlying populations in the fishery increases dramatically relative to the current harvest levels of 45 million lbs (Figure 15).

These preliminary results (USDC, 1987a) are contingent on more model runs (iterations of the simulated strategies), as well as a sensitivity analysis of the model assumptions. Also, other model runs are being conducted to assess the applicability of this model formulation to other populations that may exhibit very different underlying population dynamics (e.g. Georges Bank surf clams).

It is feasible that a constant catch can be used as a surrogate for MSY, in terms of defining a risk adverse harvesting strategy for those stocks exhibiting appropriate population dynamics. Critical parameters such as the frequency of "good" year classes will be vital to the correct interpretation of these results (USDC, 1987a).

In terms of the overall MSY, it appears that the previous estimate of 50 million lbs of shucked clam meats everywhere, is probably the best current estimate for the mid-Atlantic EEZ surf clam population.

Although tremendous variability and uncertainty exists concerning the absolute size of the pre-recruit and recruited resources off New Jersey, Delmarva and Southern Virginia - North Carolina, it is probable that the strong 1976 and 1977 year classes can be shepherded through wise management to support the fishery for at least the next 10 years. This 10 year time frame has been selected to provide stability to the fishery rather than allow catch levels to rise and fall significantly as clams are fished out over time or recruit to the fishery.

Extrapolating the mean catch per tow indices developed from the 1986 NMFS research survey yields a very rough estimate of 1.2 billion lbs of meats as a crude standing stock in the mid-Atlantic region (Table 19). With the current estimates of landings, discards, discard associated mortalities and natural mortalities this crude standing stock estimate (large year to year variability) should be sufficient to support the current fishery for 10 - 12 years. This estimate is equivalent to those presented in Murawski and Serchuk (1984a) where they state "adequate resource currently exists to support the fishery for about 14 years at 40 million lbs per year or 11 years at 50 million lbs per year". (This also includes discards.) Murawski and Serchuk (1984a) did not calculate a total standing stock estimate but rather compared the average biomass index from the late 1960s (during years which the landings produced the MSY estimate) to the early 1980s.

The standing stock estimate of clams greater than 5.5" derived from the 1986 survey is roughly 393 million lbs (Table 19). This estimate increased slightly from the 320 million lb estimate that was developed from the 1982 survey. While over 77 million lbs of meats were landed in 1986 (Table 1) large numbers of individuals from the 1976 and 1977 cohorts were becoming available to the fishery and thus this increase is logical.

A relative abundance index for surf clams in the Southern New England (Nantucket Shoals) region was computed from survey catch data and compared with other clam assessment areas in the Mid- Atlantic Bight. The Southern New England region accounts for approximately 16% of the area surveyed for clams. In 1986 an

estimated 2.8% of the total surf clam numbers and 4.7% of the total clam resource in weight occurred in the Southern New England region (Table 8). A portion of the Southern New England clam resource occurs in waters too shallow for normal survey operations (less than 30 ft). To account for the non-surveyed portion of the resource, clam densities of adjacent areas were extrapolated for the non-surveyed area. However, when the non-surveyed portion was included, the proportion of total resource weight occurring in Southern New England increased only slightly.

An assessment of potential yields from the Southern New England surf clam resource was not performed as a part of the stock assessment (Murawski and Serchuk, 1983a). However, an estimate of the total annual harvest from the Southern New England resource can be derived from resource survey data, assuming that management strategies in the two regions (Southern New England and Mid-Atlantic) are similar. The management strategy in the Mid-Atlantic is to spread the harvest of the standing stock of clams over an extended period so that each clam has a higher likelihood of numerous spawnings which increases the probability of successful year class recruitment and so that quotas are reasonably consistent over time rather than fluctuating widely as year classes recruit and are fished out. If a similar harvest strategy were adopted for Nantucket Shoals Area, then the annual quota should reflect the fact that about 5% of the total EEZ resource in weight occurs there. The OY in the Mid-Atlantic area can be as much as 2.9 million bu (50 million lbs), and a similar harvest strategy would allow at most 200,000 bu to be taken from the Nantucket Shoals Area.

The standard conversion for meat weight to bu is 17 lbs/bu for the Mid-Atlantic region. However, as reported in the assessment document, Southern New England surf clams yield substantially more meat than do similar sized clams in the Mid-Atlantic region (9 to 38% more, depending on clam size). Thus, assuming a greater meat weight/bu conversion for the Southern New England resource yields an annual landings figure of at most 200,000 bu, if management strategies (harvest to biomass ratio) are equivalent in the two areas.

Murawski and Serchuk (1984b) assessed potential harvest quotas for Georges Bank, assuming the same management strategy (that is, exploitation ratio) as for Mid-Atlantic and Nantucket Shoals Area surf clam resources. The Georges Bank resource is about 13.5% of the total surf clam population. If the ratio of clam landings to survey biomass index is similar in all three areas (and thus the exploitation rate is approximately equivalent), then the appropriate Georges Bank catch quota would be approximately 300,000 bu (5.1 million lbs of meats) per year. This strategy should result in stable catch levels for several years.

Logbook reported EEZ landings data have included the area fished reported as ten minute squares since 1983. Logbook reported EEZ landings (Table 20) for both surf clams and ocean quahogs are within about 10% of the "official" annual landings (USDC, 1988b) and since the logbooks have associated effort and location, they thus provide an excellent source for description of the fishery. Even after extensive error checking, and deletion of incomplete/missing data for erroneous areas or missing effort (either missing hours or dredge size), the total number of bushels of clams and quahogs with complete records averaged 86% and 93%, respectively (Table 20).

The areas of surf clam extraction became more confined over the years (Figures 16-20). In 1983, there were 119 (111 in the Mid-Atlantic and 8 in Nantucket) ten minute squares (roughly 100 square miles) from which surf clams were harvested. In 1985 there were only 91 ten minutes squares which included the entire Mid-Atlantic, Nantucket Shoals and Georges Bank areas. Either five or six ten minute squares per year have had at least 100,000 bushels of surf clams extracted (Table 21). In 1983, at least 100,000 bushels of clams were harvested from five squares, and the total for the five squares of 765,000 bushels accounted for 32% of the total logbook reported harvest, and 25% of the number of trips (Table 21). Following sharp increases in the percentages of clams and trips accounted for by the six large harvest squares in 1984, the 1985 percentages increased even more. By 1985 more than half the landings and number of trips occurred in only six of the 91 squares, thus also signaling a contraction of the fishing fleet's effort.

Forty eight percent of the three year total logbook reported surf clam harvest (over four million bushels) occurred in the nine 10-minute squares from which, during at least one year, more than 100,000 bushels were taken (Table 22). Fourteen percent of the total three year harvest (or over 1.1 million bushels) came from one square off of Atlantic City alone. Two other areas had a three year total harvest of more than half a million bushels (Table 22).

While tremendous quantities of clams are extracted from these artificially delineated areas of roughly 100 square miles, the catch rates have consistently increased (Table 22 and Figures 21-25). Within the nine very heavily fished areas (Table 22), catch rates have consistently increased, and in fact, generally more than tripled in the three years. This consistent increase in both CPUE (simply number of bushels caught per fishing

hour) and adjusted CPUE (former estimate standardized to a 240-inch dredge to include a dredge size effort adjustment) has been caused by the concentrated effort, the lowering of the minimum size (Amendment #5) and the availability of the excellent 1976 and 1977 year classes.

5.4.2. Ocean Quahogs

The estimate of MSY for ocean quahogs across their entire EEZ range in US waters is 6 million bu (approximately 60 million lbs of shucked meats). This estimate was developed from the information presented in Amendment #3 (MAFMC, 1981), where estimated ocean quahog biomass (derived from areal expansion) was used to calculate equilibrium yields using the model of Gulland (1971).

While MSY estimates presented in Amendment #3 (MAFMC, 1981) vary widely (0.7 million bu to 10 million bu), the assumptions associated with natural mortality and the percentage of dredge mortality associated with non-harvest appear to be the two main parameters that lead to the wide range of estimates. Ocean quahogs have a very low natural mortality since they are among the slowest growing and longest lived marine organisms. Additionally, the Gulland (1971) model for estimating MSY assumes that maximum surplus production occurs when standing stock biomass is reduced to 50% of the virgin level. The annual ocean quahog optimum yield was set at 4 to 6 million bushels in Amendment #3.

The USDC (1988a) estimate for long term potential catch of ocean quahogs is 27,200 mt, which converts to 60 million lbs or 6 million bushels. The USDC (1989) states that "long term potential catch can be used interchangeably with MSY for FMP purposes".

Based on areal expansion of average research vessel survey catch per tow data, the USDC (1986) document estimated the total quahog biomass from Georges Bank to Southern Virginia-North Carolina to be approximately 2.58 billion lbs of meat (Table 12). Of this total, 24% was located on Georges Bank, 22% off Southern New England, 23% off Long Island, 23% off New Jersey, 7% off Delmarva and less than 1% off Southern Virginia-North Carolina.

Research surveys through 1983 found no significant decline in resource abundance or recruitment in the areas being fished since the development of the EEZ fishery (Murawski and Serchuk, 1983b). Annual landings are about 2% of the total estimated stock, however, annual landings off New Jersey and Delmarva are currently about 6% of the total resource in these areas.

While a significant reduction has occurred in the number of ten minute squares that are fished for surf clams in the three years, just the opposite is true for the number of squares from which ocean quahogs are extracted (Figures 26-30). In 1983, there were 43 ten minute squares that were fished for quahogs, in 1984 50 squares, and by 1985 there were 71 squares from which quahogs were harvested. In each of the three years, more than half the squares had less than three vessels reporting, and thus had to be classified as confidential.

Also unlike surf clams, but in conjunction with the overall area being fished expanding, the number of ten minute squares from which at least 100,000 bushels of quahogs have been extracted has gradually increased. Eleven squares in 1983 accounted for 85% of the extracted bushels and 86% of the number of trips (Table 23). Twelve squares accounted for 84% of the bushels and 83% of the effort in 1984. In 1985, thirteen 10-minute squares had 78% of the extracted quahogs with 76% of the trips. This slight decreasing percentage of the harvest coming from very heavily fished areas, coupled with the increasing number of areas fished, is indicative of the more exploratory, less time regulated, nature of the ocean quahog versus surf clam effort.

Fifteen 10-minute squares have had at least 100,000 bushels of ocean quahogs extracted from them in one year during the past three years (Table 24). While data analyses currently are restricted to ten minute squares since only 1983, indications are the fishery was very concentrated in the same areas since its EEZ beginnings in the late 1970s. Thus, it is not surprising that the adjusted CPUE is generally declining (Figures 31-35). Of the 15 heavily fished squares (Table 24), nine have had over half a million bushels extracted. Of those nine, eight have shown consistent decreases in adjusted CPUE over the past three years. The only square of the nine that had over a half million bushels harvested that did not show this decrease among the three years, exhibited a relatively low adjusted CPUE in both 1983 and 1984 (245 and 229). Thus, it seems apparent that the tremendous extractions from a few areas are beginning to impact upon the fishing efficiency, and probably will result in more exploratory fishing in the future. It must be remembered that the resource is extensive and that the New Jersey and Delmarva areas account for only slightly more than 30% of the resource (Table 12).

5.5. PROBABLE FUTURE CONDITION

5.5.1. Surf Clams

Results of 1986 NMFS biological assessments indicate that surf clam biomass off both Northern New Jersey and Delmarva has been increasing due to strong 1976 and 1977 year classes off Northern New Jersey and Delmarva, respectively. The 1976 year class off Northern New Jersey began to reach commercial size in 1981 while the 1977 year class off Delmarva began to reach that size in 1983.

The Nantucket Shoals Area and Georges Bank surf clam resources are well represented by a wide range of age groups in comparison to the Mid-Atlantic, which is dominated by strong year classes. The resources in these two New England areas are apparently only a small fraction of the size of the Middle Atlantic resource (Table 8).

A relative abundance index for surf clams in the Southern New England (Nantucket Shoals) region was computed from survey catch data and compared with other clam assessment areas in the Mid-Atlantic Bight. The Nantucket Shoals region accounts for approximately 16% of the area surveyed for clams. An estimated 3% of the total surf clam number and 5% of the total clam resource in weight occurred in the Southern New England region (Table 8). The Southern New England region contained large surf clams (with a wide range of year classes), with 91.6% of the clams in the survey equal to or larger than 5.5".

The Georges Bank Area accounts for 23% of the area surveyed in 1986 and contained 16.5% of the surf clam resource (in numbers) and 13.5% of the resource in weight (Table 8). The areas surveyed off Long Island accounted for 12% of the area, 0.6% of the resource in numbers and 0.9% of the resource in weight. For purposes of comparison, the Northern New Jersey region had 13% of the area and 16.5% (numbers) and 21.2% (weight) of the resource; Southern New Jersey accounted for 5% of the area and 2.5% (numbers) and 5.3% (weight) of the resource; the Delmarva region had 20% of the area and 56.2% (numbers) and 50.0% (weight) of the resource; and the Southern Virginia-North Carolina region accounted for 11% of the area and 4.9% (numbers) and 4.3% (weight) of the resource. Unfortunately, in 1986 the majority of the resource in the Delmarva region was still less than 5" (Table 8).

Although tremendous variability and uncertainty exists concerning the absolute size of pre-recruit and recruited resources off New Jersey, Delmarva, and Southern Virginia-North Carolina, it is probable that the strong 1976 and 1977 year classes (Figure 5) can be shepherded through wise management to support the fishery for at least the next 10 years. This 10 year time frame has been selected to provide stability to the fishery rather than allow catch levels to rise and fall significantly as clams are fished out over time or recruit to the fishery. If the same management strategy is assumed for the Nantucket Shoals area and Georges Bank area that is used in the Mid-Atlantic, the strategy should result in stable catch levels for several years.

5.5.2. Ocean Quahogs

The ocean quahog resource is large relative to current catch levels. While annual landings represent about 2%, the fishery is not spread evenly across the entire resource, and is concentrated at present off New Jersey and Delmarva, where annual EEZ landings constitute at least 6% of the harvestable stock. Resource surveys of the New Jersey and Delmarva areas have not revealed any detectable declines in total quahog abundance. These surveys were designed to evaluate resource conditions over relatively large areas, and are imprecise in documenting fishery effects in small localized areas such as those being fished. Current utilization rates in Delmarva and New Jersey areas are within the range of values maximizing YPR, and the current harvest quota appears appropriate for controlling the rate of harvest of the Delmarva-New Jersey resource at about 6% per year. Murawski and Serchuk (1983b) believe that given the relatively poor recent recruitment throughout the entire range of the species and the extremely slow growth rate, annual landings (coming only from New Jersey and Delmarva) substantially in excess of 60 million lbs are probably excessive.

6. DESCRIPTION OF HABITAT

6.1. HABITAT REQUIREMENTS AND HABITATS OF SURF CLAMS AND OCEAN QUAHOGS

6.1.1. Habitat Requirements

The surf clam is one of the largest bivalves living on the continental shelf of eastern North America and is distributed from the southern Gulf of St. Lawrence to Cape Hatteras. A much broader latitudinal range, through the Gulf of Mexico was given in Merrill and Ropes (1969), but there is evidence that the populations south of Cape Hatteras are actually a distinct subspecies (Jacobsen and Old, 1966). Commercial

concentrations are found primarily in sandy sediments off New Jersey and the Delmarva Peninsula (Figure 1), although some fishable quantities exist in southern New England waters and on Georges Bank (Figures 2 and 3).

Surf clams are predominantly oceanic, most common in turbulent waters just beyond the breaker zone (Ropes, 1980). Encroachment into estuarine zones is probably limited by salinity requirements (Fay *et al.*, 1983). Surf clams are generally found from the beach zone to a depth of about 200 ft; beyond 130 ft however, abundance is low (USDC, 1988a)

Ocean quahogs are found on both sides of the North Atlantic ocean. Distribution ranges from Newfoundland to Cape Hatteras in depths from 30 ft to 800 ft in the western Atlantic. Quahogs are rarely found when bottom water temperatures exceed 60° F and thus occur progressively further offshore between Cape Cod and Cape Hatteras. Highest densities in the mid-Atlantic region are between 130 ft and 200 ft; few quahogs have been found in the mid-Atlantic in excess of 300 ft (USDC, 1988a). Medcof (1958) has reported large stocks in the Southern Gulf of St. Lawrence; other major areas of concentrations have been reported along the coasts of Scandinavia, Greenland, and Newfoundland (Parker and McRae, 1970). Ocean quahogs are probably present on much, if not most, of the continental shelf of North America.

Some information is available on environmental conditions influencing the distribution of ocean quahogs. Turner (1949 and 1953) believed that temperature may be the factor influencing the depth zonation of the species. Intolerance to high temperatures probably explains its absence from shallow water in the southern part of the range (Merrill *et al.*, 1969).

The southern distribution of surf clams is limited by water temperatures of 23° (Saila and Pratt, 1973). This fact becomes apparent when the depth distribution of adult clams is examined. Adults are found intertidally in New England, but no significant numbers are found inshore off the Delmarva Peninsula. The fishery started in New England; clams were harvested with hand equipment (Yancey and Welch, 1968). No commercial beds are found inshore off Delmarva (Loesch and Ropes, 1977) but commercial quantities are found 15 or more miles off the coast (Caracciolo and Steimle, 1983). This phenomenon is not from lack of recruitment inshore, because densities of spat as high as 1 - 2 million per mile were estimated in the intertidal zone of Wallops Island, Virginia (Yancey and Welch, 1968). Mortality of these recruits were attributed to high water and air temperatures (Ropes and Merrill, 1970).

Both surf clams and ocean quahogs prefer sand for a substrate. However, surf clams are found in coarser sediments (Caracciolo and Steimle, 1983). Surf clams are well adapted to scouring environments, as evidenced by the fact that they can rapidly reburrow when displaced, but eventually suffocate when sediments cover their extended siphons (Ropes and Merrill, 1973; Ropes and Merrill, 1966).

Spawning in surf clams has been reported to occur both during a single time and over multiple periods from mid July through early November (Fay *et al.*, 1983). Within a bed of clams, spawning is probably a synchronous, annual event (Ropes, 1968). Water temperature is an important factor influencing initiation and time of spawning (Ropes, 1980), and may also influence the rate of gonadal ripening and number of major spawning periods per year. After eggs and sperm are broadcast, fertilization occurs in the water column above the spawning bed of clams (Murawski and Serchuk, 1981).

Spawning in ocean quahogs occurs over a prolonged period from May through November with spawning activity being most intense from August through November (Mann, 1982). Multiple annual spawnings at both the individual and population level occur. After an assessment of the hydrographic conditions in the area, Mann (1982) hypothesized that larval survival is probably greatest during the months of October and November, which is the breakdown of the intense seasonal thermocline and before the onset of low winter seawater temperatures.

Eggs and larvae of both surf clams and ocean quahogs are planktonic and water currents in areas inhabited are important in determining eventual patterns of distribution and settlement for developing juveniles. Dispersal and redistribution of surf clams to other areas, through swimming and crawling activities and water currents, occur primarily during the larval stages. The generalized surface water layer circulation between the Gulf Stream and the East Coast (that is, the area inhabited by surf clams and ocean quahogs) is a southerly flow (Figure 6), so that planktonic eggs and larvae generally would be drifting from north to south. Specific information, however, on the interaction of water currents and larval settlement patterns is unavailable (Ropes, 1980).

Surf clam larvae tolerate a water temperature range from 57 to 86° F (Loosanoff and Davis, 1963). Survival of spawning adults and their fertilized eggs was significantly affected at water temperatures of 86° F. Lethally

low water temperatures for adult surf clams are probably never reached in their oceanic habitat, but low air temperatures may freeze exposed gill tissue in live clams temporarily washed up onto the beach during storms (Ropes, 1980). Water temperature is also important for initiation and rate of gonadal development, as well as for initiation and timing of spawning (Ropes, 1968).

Temperature tolerance in ocean quahogs is much lower than for surf clams. Turner (1953) suggested that the thermal death point for the species is low, probably about 55 to 60° F. He mentioned that specimens held in tanks at 70° F died within a few days.

Salinity is vitally important for these species, in that it probably limits encroachment into many estuarine areas. Minimum salinities for larval and adult surf clam survival were 16 ppt and 12.5 ppt, respectively (Castagna and Chanley, 1973). Adult surf clams tolerated salinities from 14 ppt to 52 ppt (Theede, 1965). Less is known of the salinity tolerance of ocean quahogs, but Loosanoff (1953) suggested that the optimum salinity range for the existence and propagation of the species is between 31 ppt and 35 ppt.

Several instances of severe depletion of dissolved oxygen in the bottom waters of the ocean along the New Jersey and Long Island coasts have produced surf clam and ocean quahog mortalities. A major event of this type occurred in the spring and summer of 1976. Anoxic water developed over clam beds between Cape May, New Jersey and Long Island's south shore, out to a depth of 250', because of the combined effects of meteorological and hydrographic conditions, organic loading from human waste dump sites, and an unusually large bloom and die off of the dinoflagellate *Ceratium tripos* (Steimle and Sindermann, 1978). The kill area (Figure 36) was estimated at 2,600 square miles, and resulted in a decrease in New Jersey surf clam biomass of 78.5 percent and a decrease in biomass in New Jersey quahogs of 7.1 percent (Ropes *et al.*, 1979).

All available evidence indicated that the specific events that caused development of anoxic bottom waters in 1976 were: (1) an unusually warm winter, with highest river runoff in February rather than April, thus allowing early development of dense dinoflagellate populations; (2) earlier than normal thermal stratification, sealing off organically rich, oxygen demanding water early in the spring; (3) additional organic loading from human waste dump sites off New Jersey and Long Island; (4) limited water mass movement for an extended period, due to a persistent southerly flow of air; and (5) abnormally low cyclonic storm activity over the same 4 to 6 week period. Any one of these events probably would not have caused oxygen depletion to the extent observed, but together they devastated New Jersey and Long Island surf clam populations (Steimle and Sindermann, 1978).

Little specific information is available concerning the long term or short term dissolved oxygen requirements of surf clams or ocean quahogs. However, since part of the estimated kill zone in 1976 was between the 1.0 and 2.0 ppm dissolved oxygen isopleths, a lower lethal limit of 2.0 ppm can be assumed until more detailed information on oxygen requirements is collected (Fay *et al*, 1983).

Two major classes of pollutants have been documented to affect surf clam and ocean quahog populations or exploitation of those populations: (1) human refuse, sewage, and sludge (ocean dumping) and (2) metals.

Zoellner (1977) reviewed water quality problems related to molluscan shellfish and the effectiveness of current discharge control laws. Although natural phenomena, dredging, and chemical contamination were all noted as having significant impacts on shellfish populations, he considered domestic waste discharge to have the greatest negative impact on sanitary conditions in and around shellfish beds. Positive fecal coliform counts were reported in 70% of surf clam samples taken offshore of Delaware Bay in 1966 and 1967 (Buelow, 1968).

The continual leaching of contaminants from oceanic dump sites into the water and sediments and the uptake by sedentary oceanic fauna have forced closure of various important clam harvesting areas of the mid Atlantic Bight over the past two decades (Fay *et al.*, 1983). Elevated concentrations of iron and copper (Lear *et al.*, 1973) and chromium and nickel (Buelow, 1968) were found in surf clams collected near sewage and acid waste dump sites offshore of Delaware Bay.

Relatively high concentrations of cadmium, copper, nickel, vanadium, chromium, and zinc were found in surf clams from Delaware Bay (Reynolds, 1979), though sample sizes were too small to test statistically. The Delaware Bay has relatively low levels of heavy metals compared to other East Coast estuarine systems (Bryson, pers. comm.). Mean arsenic concentrations for all stations in the mid Atlantic Bight were 2.1 ppm in surf clams and 3.0 ppm in ocean quahogs, a range exceeding allowable levels (1.14 ppm) recommended by the Australian National Health and Medical Research Council (Wenzloff *et al.*, 1979). The US EPA has not established recommended levels for arsenic, however since the distribution of arsenic concentrations did not

vary greatly with latitude, it may indicate that background levels along the mid Atlantic coast are higher than those in Australian waters (Wenzloff *et al.* 1979).

6.1.2 Habitats of Surf Clams and Ocean Quahogs

The Council, attempting to coordinate and obtain the best information available, requested each State from Virginia to Maine to identify the critical surf clam and ocean quahog habitat under their jurisdiction. The following paragraphs are paraphrased from the responses of the States' surf clam and ocean quahog experts.

Virginia indicates that although they have some patchy distribution of surf clams within the State's three mile limit, there are no harvestable populations of surf clams or ocean quahogs (DiCosimo, pers. comm.); therefore it is assumed that they have no critical habitat for these two species.

Maryland has no critical habitat for surf clams or ocean quahogs (Jensen, pers. comm.).

Delaware (Cole, pers. comm.) believes that the entire Delaware Territorial Sea, extending from the mouth of the Bay to 38° 27′ N latitude and out three nautical miles contains suitable habitat that once supported commercial densities of surf clams.

There is no evidence that these two species of clams are extant in Pennsylvania waters (Miller, pers. comm.). This would be expected with basically fresh water salinity profiles.

New Jersey has no critical habitat for ocean quahogs within the territorial waters of their State (Cookingham, pers. comm.). The entire New Jersey coast from Cape May to Sandy Hook and from the beach to three miles offshore encompasses New Jersey's surf clam habitat and all of this is considered critical habitat.

New York would like to consider all inshore waters under State control as critical habitat for both surf clams and ocean quahogs (Fox, pers. comm.). Active food fisheries do exist in parts of these waters, and the uncertified westernmost areas support an important seasonal harvest for bait purposes. The more eastern areas, while not presently supporting significant harvests, do contain some surf clams and ocean quahogs, and thus represent areas of potential harvest in the event a set should occur and recruit into the fishery.

A recent inventory of shell fish populations in Connecticut waters of Long Island Sound identified low to moderate densities of surf clams at several sampling locations (Gunn, pers. comm.). The ocean quahog is not found in Long Island Sound but does occur in large concentrations in Rhode Island and Block Island Sounds. Gunn (pers. comm.) did not specify any Connecticut waters as being critical to surf clams or ocean quahogs.

Rhode Island has extensive inshore concentrations of surf clams within the Harbor of Refuge, Sakonnet River and along the south shore beaches (Borden, pers. comm.). Concentrations of ocean quahogs were identified by Fogarty (1981). Surf clams or ocean quahogs were found at all sample stations within the territorial waters of Rhode Island and therefore, those areas are considered critical habitat areas (Borden, pers. comm.).

Massachusetts identified three major areas of their State waters as critical habitat for ocean quahogs and surf clams (Hoar, pers. comm.). First, the area extending one mile from shore south of Horseneck beach between the mouth of the Westport River and Gooseberry Neck. Second, the southern three mile state territorial waters strip extending east from Gay Head, Martha's Vineyard, to Low Beach, Nantucket, and from Low Beach north to Race Point in Provincetown. Muskeget Channel, between Muskeget and Tuckernuck Islands, is also included in this area. Third, all of Cape Cod Bay south of a line drawn from Green Harbor (north of Duxbury Beach) to Race Point, Provincetown.

New Hampshire has limited surf clam and ocean quahog habitat with a small commercial surf clam fishery (Spurr, pers. comm.). No critical habitat is presently identified.

Maine did not respond.

6.2. HABITAT CONDITION

Surf clams and ocean quahogs are exposed to a range of environmental conditions and contaminants during their life history. Recent assessments made by the Ocean Pulse and Northeast Monitoring Programs indicate extensive, detrimental amounts of toxic organic and inorganic contaminants, such as heavy metals, PCBs, and petroleum hydrocarbons in the various physical compartments of the marine ecosystem (Boehm and Hirtzer, 1982; Boehm, 1983; Pearce, 1979; Reid *et al.*, 1982). This is particularly true for sediments in the Mid-Atlantic Bight that receive contaminated dredged materials, sewage sludge, and industrial wastes. Elevated levels of petroleum hydrocarbons have even been found in small estuaries as far north as Maine. Elevated

PCB levels have been found in sediments and biota in Buzzards Bay, in the New York Bight apex, and other places (Reid *et al.*, 1982).

PCBs are suspected carcinogens to humans; however, comprehensive research has not yet been done on the significance of elevated body burdens to the shellfish themselves, or to reproductive processes and subsequent recruitment of larval, juvenile, and prerecruits to adult shellfish stocks. Laboratory and field effects of a range of organic contaminants have been measured; however, how contaminants such as PCBs affect the behavior, biochemistry, genetics, or physiology of these shellfish at either the lethal or sublethal levels is not well understood. It is significant that where elevated levels of PCBs have been reported in the marine environment, they have generally been associated with elevated levels of toxic heavy metals, petroleum hydrocarbons, and other contaminants and thus the deleterious effects may be more pronounced.

Most research on the toxicological effects of various contaminants in shellfish is recent. Many anomalies probably have not been described or their magnitude documented. The Councils encourage fishermen to report or provide shellfish with tumorous type growths to: Dr. John C. Harshberger, Director, Registry of Tumors in Lower Animals, Smithsonian Institution, Museum of Natural History, Washington, DC 20560 (202-357-2647) or to Mr. Martin Newman, NMFS, Oxford Laboratory, Railroad Ave., Oxford, MD 21654 (301-226-5193).

Coastal areas are vitally important for surf clams and ocean quahogs. Our knowledge and understanding of the influence of estuarine "outwellings" (plumes) on the contiguous shelf ecosystems is in its infancy (Campbell and Thomas, 1980), but the significant existence is certainly undeniable. Population shifts to coastal areas and associated industrial and municipal expansion have accelerated competition for use of the same habitats. It is projected (48 *FR* 53142-53147) that by 1990, 75% of the US population will live within 50 miles of the coastlines (including the Great Lakes). As a result, these habitats have been substantially reduced and continue to suffer the adverse effects of dredging, filling, coastal construction, energy development, pollution, waste disposal, and other human related activities. In the case of wetlands, from 1954 to 1978 there was an average annual loss of 104,000 acres which was a ten fold annual increase in acreage lost between 1780 and 1954 (48 *FR* 53142-53147). The pressure on coastal and ocean habitats is nowhere greater than in the densely populated, industrialized Northeast. It is obvious that new systems are needed to conserve habitats and living marine resources, while facilitating the completion of necessary, compatible economic developments. Toward this goal, NMFS issued its formal Habitat Conservation Policy in November 1983 (48 *FR* 53142-53147). The goal of the policy is: "to maintain or enhance the capability of the environment to ensure the survival of marine mammals and endangered species and to maintain fish and shellfish population which are used, or are important to the survival and/or health of those used, by individuals and industries for both public and private benefits - jobs, recreation, safe and wholesome food and products". The Habitat Conservation Policy provided impetus to NMFS's Regional Action Plan (RAP) process which is to foster coordinated management and research responses to major habitat conservation issues and problems, and to develop better steps to address them in the future (USDC, 1985).

The RAP process identified six water management units in the Northeast region (Figure 37). The boundaries of each water management unit (WMU) were established on the basis of the biogeographic consistency of the entire WMU and its distinctness from other WMUs. Each WMU is relatively consistent in its physical and chemical characteristics with normal latitudinal and seasonal variations in temperature, salinity, and nutrient content. The diverse biota in these WMUs include both endemic and migratory species that exhibit normal seasonal fluctuations in species composition, individual population size, and geographic distribution. These six units are: Coastal Gulf of Maine, Gulf of Maine, Georges Bank West to Block Channel, Coastal Middle Atlantic, Middle Atlantic Shelf, and Offshelf (USDC, 1985).

The Coastal Gulf of Maine WMU encompasses an area bounded seaward by the observable limits of coastal processes, including riverine and estuarine plumes, coastal upwelling and diurnal tidal fluxes. Geographically, the area is bounded on the northeast by the Canadian Border and on the southwest by Cape Cod. This zone is generally marked by steep terrain and bathymetry, joining at a rock bound coastline with numerous isles, embayments, pocket beaches, and relatively small estuaries. Circulation is generally to the southwest along Stellwagen Bank, and finally offshore at Cape Cod. The habitats are presently affected by ocean disposal and effluents from major urban areas, along with significant non point source pollution associated with the various rivers. Continued pressure to fill already depleted marsh and shallow water areas occurs in most parts of the area (USDC, 1985).

The Gulf of Maine is a semi-enclosed sea of 55,000 square miles separated from the Atlantic Ocean by Browns and Georges Banks. It is an area of five major basins, floored with clays and gravelly silts, and broken by rocky

outcroppings, numerous ledges and banks. The circulation is only generally understood: a seasonal clockwise gyre swings around the Gulf and joins the clockwise gyre on the northern edge of Georges Bank. Presently, threats to the area are from the coastal Gulf of Maine and from ships transiting the area (USDC, 1985).

The Georges Bank West to Block Channel WMU includes Georges Bank, The Great South Channel, and Nantucket Shoals. These areas have similar habitats, biota and hydrographic regimes. Overall, this WMU is highly productive and heavy fishing pressure is exerted on its numerous fish and shellfish. It is threatened by OCS exploratory drilling and by non point source pollution from atmospheric fallout, general circulation patterns, and marine transportation activities (USDC, 1985).

The Coastal Middle Atlantic WMU encompasses a zone from Cape Cod southwest to Cape Hatteras. The area is characterized by a series of sounds, broad estuaries, large river basins and barrier islands. The predominantly sand bottom is characterized by a ridge and swale topography. The waters of the Coastal Middle Atlantic have a complex and seasonally dependent pattern of circulation. Seasonally varying winds and irregularities in the coastline result in the formation of a complex system of local eddies and gyres. Currents tend to be strongest during the peak river discharge period in late spring and during periods of highest winds in the winter. In late summer, when winds are light and estuarine discharge is minimal, currents tend to be sluggish, and the water column is generally stratified. The Coastal Middle Atlantic provides major habitats for anadromous, estuarine, and endemic species. Migratory species play a major role in this WMU, and make up the predominant stocks in various seasons. Surf clams and ocean quahogs constitute the major benthic fauna. Estuaries provide major spawning and nursery areas for many of the endemic and migratory species. These species are presently affected by non point and point sources of pollution from major rivers and urban areas, as well as by direct loss of habitat caused by filling of wetlands, damming and diversion of rivers, and mosquito ditching in marshes (USDC, 1985).

The Middle Atlantic Shelf WMU covers the area from the Block Island Front southward to Cape Hatteras. The inshore boundary follows the observable limits of coastal processes, primarily estuarine plumes, and lies approximately 30 miles from the coast. This WMU generally is characterized as a sandy plain, with a ridge and swale topography. Numerous submarine canyons intersect this area. The surface circulation over the shelf can be divided into a two celled system, separated at the Hudson Valley. The subsurface and bottom circulation tends to flow in a westerly-southwesterly direction that varies with the passage of weather systems and offshore warm core rings. Hydrographic conditions vary seasonally from vernal freshening and warming, through summer stratification, to fall/winter breakdown and cooling. This WMU has a different faunal composition than the Gulf of Maine or Georges Bank. Fish populations are predominantly migratory, and species composition varies with season. Ocean quahogs are one of the major benthic organisms. It is threatened by OCS exploratory drilling; by non point source pollution from atmospheric fallout, general circulation patterns, and marine transportation activities; and by ocean disposal of sewage sludge and industrial wastes.

The Offshelf WMU encompasses the zone defined by the mean observable limits of the shelf-slope front seaward to the mean axis of the Gulf Stream. The area is overlain by the Slope Water Regime, a mass of relatively warm saline water having a generally weak circulation to the southwest. The upwelling area along the inner boundary of the shelf-slope front is high in productivity and rich in commercially valuable fish and shellfish. The general flow of the surface water layer between the Gulf Stream and the land is towards the south (Figure 6). Offshore, the Gulf Stream undulates as it moves to the northeast, forming a dynamic boundary from which warm core rings are borne. These rings spawned at a rate of about eight per year, are about 50 to 100 miles in diameter; they break off east of the area and transit to the southwest, eventually coming in contact with the shelf at southwestern Georges Bank. The passage of each ring marks a major event in the hydrographic regime and may significantly affect the biota of the shelf-slope front and possibly of the shelf itself. Other than ring passages, impacts on the offshelf waters are primarily from non point source pollution from atmospheric fall out, marine transportation, and from point source pollution from dumping at Deepwater Dumpsite 106 and ocean incineration (USDC, 1985).

Each of the oceanic areas identified in Section 6.1 as important for surf clams and ocean quahogs is subject to numerous man caused habitat threats. Rather than spend extensive efforts detailing degradation in individual oceanic systems (an effort generally already being performed by the individual States), this section will broadly address the major types of abuse (that is, agricultural, urbanization, and industrialization) dominant in the largest, most important areas (that is, Chesapeake Bay, Hudson River/Long Island Sound, and the New England coast).

Extensive urban development along the western shore of the Chesapeake has resulted in human population and industrial growth at the expense of the natural environment. The Baltimore-Washington-Norfolk corridor is a major demographic region where numerous commercial and industrial activities are centered. These activities have adversely affected the environment through habitat modification and destruction, and the introduction of contaminants in point and non-point source discharges. The eastern shore of the bay is primarily agricultural and residential. Uncontrolled agricultural and suburban runoff, however, also introduces significant quantities of sediments, trace metals, and chemicals that degrade water quality.

The Hudson River/Long Island Sound area is heavily urbanized and in parts industrialized or supportive of large-scale agriculture. The middle and upper Hudson River valley and eastern Long Island support extensive agricultural areas and large populations with the associated habitat abuses. The lower portion of the Hudson River area, northern New Jersey, and western Long Island are inhabited by the greatest concentration of people anywhere in the US as well as supporting extensive utility, petro-chemical, and other heavy industry.

The New England coast, since heavily developed, has some of all three major types of abuse. However, the areas are generally localized (that is, an individual power generating station or urbanized center) and since the estuaries are only used on a limited basis, the abuses do not seem as detrimental as those in the previously mentioned systems.

In summary, the most concise synopsis of the health of the Nation's marine environments can be viewed as that presented in the findings of the Congressional Office of Technology Assessment report (1987):

"• Estuaries and coastal waters around the country receive the vast majority of pollutants introduced into marine environments. As a result, many of these waters have exhibited a variety of adverse impacts, and their overall health is declining or threatened.

• In the absence of additional measures, new or continued degradation will occur in many estuaries and some coastal waters around the country during the next few decades (even in some areas that exhibited improvements in the past)."

6.3. CAUSES OF POLLUTION AND HABITAT DEGRADATION

6.3.1. General Habitat Degradation Causes

The Council in efforts to coordinate with NMFS has adopted the NMFS Regional Action Plan's (USDC, 1985) identified environmental trends as potential issues that may affect the habitats of surf clams and ocean quahogs.

Estuarine and coastal lands and waters are used for many purposes that often result in conflicts for space and resources. Some uses may result in the absolute loss or long term degradation of the general aquatic environment or specific aquatic habitats, and pose theoretically significant, but as yet unquantified, threats to the biota and their associated habitats. Issues arising from these activities, and the perceived threats associated with them, are of serious concern to the public.

Multiple-use issues are constantly changing, as are the real or perceived impacts of certain activities on living marine resources. The coastal and oceanic activities that generate these issues can threaten living marine resources and their habitats. Threats to resources occur when human activities cause changes in physical habitat, water and sediment chemistry, and structure and function of biological communities.

The Coastal Middle Atlantic and Coastal Gulf of Maine WMU (section 6.2) share similar activities that threaten habitats and the well being of living marine resources in estuarine and nearshore areas. Likewise, the Gulf of Maine, Georges Bank, Middle Atlantic Shelf and Offshore WMUs share similar activities that threaten the welfare of biota and habitats in offshore areas.

The following discussion identifies and describes each multiple use issue and the potential threats associated with that issue (USDC, 1985). For the purposes of this discussion, an "issue" is a point of debate or controversy evolving from any human activity, or group of activities, that results in an effect, product, or consequence. Environmental and socio-economic issues remaining to be resolved satisfactorily with regard to their impacts on marine organisms, their habitats, and man developed from the multiple, often conflicting uses of coastal lands and waters.

6.3.1.1. Waste disposal and ocean dumping

The Atlantic Ocean off the northeastern United States has been and continues to be used for the disposal of wastes, including sewage sludge, dredged material, chemical wastes, cellar dirt, and radioactive material.

Some waste treatment methods, such as chlorination, pose additional problems to aquatic species. Habitats and associated organisms have been degraded by long term ocean disposal, particularly of sewage wastes. Sewage pollution causes closure of shellfish beds, and occasionally, of public swimming areas. Additional research on the impacts of ocean disposal at deepwater dump sites is urgently needed (USDC, 1985). Until these impacts can be determined dumping should cease.

Ocean disposal of sewage sludge, industrial waste products, dredged material, and radioactive wastes degrades water quality and associated habitats. The Deepwater Dumpsite is 106 miles offshore. Concentrations of heavy metals, pesticides, insecticides, petroleum products, and other toxics all contribute significantly to degradation of waters off the northeastern States. Organic loading of estuarine and coastal waters is an emerging problem. Symptoms of elevated levels include excessive algae blooms, shifts in abundance of algal species, biological oxygen demand (BOD) increases in sediments of heavily affected sites, and anoxic events in coastal waters. Changes in biological components are a consequence of long term ocean disposal. Harmful human pathogens and parasites can be found in biota and sediments in the vicinity of ocean dump sites. In addition, shellfish harvesting grounds have been closed because of excessive concentrations of pathogenic and indicator species of bacteria.

The deeper waters of the offshore WMUs present a different set of problems, compared with shallower waters, with respect to oceanic currents, warm core rings, and other physical and chemical oceanographic processes. Furthermore, less is known and understood about deepwater ecosystems than their shallow water counterparts. It is imperative that studies be undertaken to reveal the fate and role of contaminants in deepwater ecosystems, and to refine information about the shelf ecosystem through which these materials may be transported (USDC, 1985).

6.3.1.2. Coastal urbanization

Tremendous development pressures exist throughout the coastal area of the Northeast Region. More than 2000 permit applications are processed annually by the NMFS Northeast Region for commercial, industrial, and private marine construction proposals. The proposals range from generally innocuous open pile structures, to objectionable fills that encroach into aquatic habitats thereby eliminating their productive contribution to the marine ecosystem. The projects range from small- scale recreational endeavors to large-scale commercial ventures to revitalize urban waterfronts.

Associated with marine construction are a number of impacts which affect living marine resources directly, and indirectly through habitat loss or modification. Many of these projects are of sufficient scope to singly cause significant, long term or permanent impacts to aquatic biota and habitat; however, most are small scale causing minor losses or temporary disruptions to organisms and environment. The significance of small-scale projects lies in the cumulative effects resulting from the large number of these activities.

Urban construction is not limited to the shore, but upland development, too, which can adversely impact aquatic areas. One of the major problems arising from urban development is the increase in non-point source contamination of estuarine and coastal waters. Highways, parking lots, and the reduction in terrestrial vegetation and fringe marshes facilitate runoff loaded with soil particles, fertilizers, biocides, heavy metals, grease and oil products, PCBs, and other material deleterious to aquatic biota and their habitats. Atmospheric emissions resulting from certain industrial processes contain sulphurous and nitrogenous compounds that contribute to acid precipitation, a growing source of concern in some fresh water sections of tidal streams. Non point pollution is incorporated in water, sediments, and living marine resources. Although non point sources of pollution do not usually cause acute problems, they can contribute to subtle changes and increases of contaminants in the environment (USDC, 1985).

As residential, commercial, and industrial growth continues, the demand for potable, process, and cooling water, flow pattern disruption, waste water treatment and disposal, and electric power increases. As ground water resources become depleted or contaminated, greater demands are placed on surface water through dam and reservoir construction or some other method of freshwater diversion. The consumptive use of significant volumes of surface freshwater causes reduced river flows that can affect downstream salinity regimes as saline waters intrude further upstream.

Water that is not lost through consumptive uses is returned to the river or streams as point source waste water discharges. Although the waste water generally is treated, it still contains contaminants. Domestic waste water contains residual chlorine compounds, nutrients, suspended organic and inorganic compounds, trace metals and bacteria. Industrial discharges may contain many dissolved and suspended pollutants,

including metals, toxic substances, halogenated hydrocarbons, petroleum products, nutrients, organics and heat.

Construction in and adjacent to waterways often results in elevated suspended solids emanating from the project area. The distance the turbidity plume moves from the point of origin is dependent upon tides, currents, nature of the substrate, scope of work, and preventive measures employed by the contractor. Excessive turbidities can abrade sensitive epithelial tissues, clog gills, decrease egg buoyancy, reduce light penetration; thereby affecting photosynthesis of phytoplanktonic and submerged vegetation, and cause localized oxygen depression. Suspended sediments subsequently settle, which can destroy or degrade productive shellfish beds and nursery sites.

The effects of turbidity and siltation are generally temporary and short term, and dependent on the cause. Other construction activities can result in permanent loss or long term disruption of habitat. Dredging can degrade productive shallow water and destroy marsh habitat or resuspend pollutants, such as heavy metals, pesticides, herbicides, and other toxins. Concomitant with dredging is spoil disposal, which traditionally occurred on marshes or in open water. Shoreline stabilization, if done improperly, can result in gross impacts, through filling of inter-tidal and sub-littoral habitat; or cause subtle effects, resulting in the elimination of the ecotone between shore and water, or through the scouring of benthic habitat by reflective wave energy.

Sewage treatment effluent produces changes in biological components as a result of chlorination and increased contaminant loading. Sewage treatment plants constructed where the soils are highly saturated often allow suburban expansion in areas that would have otherwise remained undeveloped, thereby exacerbating already severe pollution problems in some areas.

Another aspect of urban development is non point source pollution, which is caused by land based activities that result in materials being transported to aquatic areas. Certain pollutants (pathogens, phosphorus, sediments, heavy metals and acid precipitation) from non point sources are demonstrable problems in Atlantic coastal and estuarine waters (USDC, 1985). Non point source pollution appears to be a chronic threat that will affect the Northwest Atlantic Ocean in the upcoming decades.

Diversion of freshwater to other streams, reservoirs, industrial plants, power plants, and municipalities can change the salinity gradient downstream and displace spawning and nursery grounds. Patterns of estuarine circulation necessary for larval and plankton transport could be modified. Such changes can expand the range of estuarine diseases and predators associated with higher salinities that affect commercial shellfish.

Industrial waste water effluent is regulated by EPA through permits. While the National Pollution Discharge Elimination System provides for issuance of waste discharge permits as a means of identifying, defining, and where necessary, controlling virtually all point source discharges, the problems remain due to inadequate monitoring and enforcement. It is not possible presently to estimate the singular, combined, and synergistic effects on the ecosystem impacted by industrial (and domestic) waste water.

6.3.1.3. Energy production and transport

Energy production facilities are widespread along Atlantic coastal areas. Electric power is generated by various methods, including land based nuclear power plants, hydroelectric plants, fossil fuel stations, and possibly future offshore floating nuclear power plants. These facilities compete for space along the coastal zone; they require water for cooling and, in the case of coal fired plants, generate voluminous amounts of fly ash and sulfur dioxide, as well as electricity. In addition, hydroelectric plants, with their need for dams, substantially modify river courses and affect anadromous fish runs and/or restoration programs.

The impacts on the marine and estuarine environment resulting from the various types of power plants include water consumption, heated water and reverse thermal shock, entrainment and impingement of organisms, discharge of heavy metals and biocides in blowdown water, destruction and elimination of habitat, and disposal of dredged materials and fly ash (USDC,1985).

The Outer Continental Shelf (OCS) exploratory and production drilling and transport may affect biota and their habitats through the deposition of drilling muds and cuttings. Oil spills resulting from well blowouts, pipeline breaks, and tanker accidents are of major concern. Seismic testing operations can interfere with fishing operations and damage or destroy fishing gear. In addition, exclusion areas around drilling rigs can result in conflicts between fishermen, both recreational and commercial, and the oil companies.

6.3.1.4. Port development and utilization

All ports require shore side infrastructure, mooring facilities, and sufficiently deep channels. Ports compete fiercely for limited national and international markets and continually strive to upgrade their facilities. Dredging and dredged material disposal, filling of aquatic habitats to create fast land for port improvement or expansion, and degradation of water quality are the most serious perturbations arising from port development.

6.3.1.5. Agricultural development

Agricultural development can affect fisheries habitat directly through physical alteration and indirectly through chemical contamination. Fertilizers, herbicides, insecticides, and other chemicals are washed into the aquatic environment with the uncontrolled non point source runoff draining agricultural lands. These chemicals can affect the growth of aquatic plants, which in turn affects fish, invertebrates, and the general ecological balance of the water body. Additionally, agricultural runoff transports animal wastes and sediments that can affect spawning areas, and generally degrade water quality and benthic substrate. Excessive uncontrolled or improper irrigation practices often exacerbate the contaminant flushing as well as deplete and contaminate ground water. One of the most serious consequences of erosional runoff is that the frequent dredging of navigational channels results in dredged material that requires disposal, often in areas important to living marine resources (USDC, 1985).

6.3.1.6. Marine mineral extraction

Mining for sand, gravel and shell stock in nearshore coastal and estuarine waters can result in the loss of infaunal benthic organisms, modifications of substrate, changes in circulation patterns, and decreased dissolved oxygen concentrations at deeply excavated sites where flushing is minimal. Sand and gravel mining tends to result in suspended materials at the mining sites, and turbidity plumes may move several miles from individual sites. Mining also results in ranges in sediment type or sediment quality, often over areas measurable in square miles. Deep borrow pits created by mining may become seasonally or permanently anaerobic (USDC, 1985).

6.3.1.7. Coastal and wetland use and modification

Intense population pressures have adversely affected many estuarine and marine habitats along the Atlantic coast. Demand for land suitable for home sites, resorts, marinas, and industrial expansion has resulted in the loss or alteration of large areas of wetlands through dredging, filling, diking, ditching, upland construction, and shoreline modification.

As residential and commercial use of coastal lands increased, so does the recreational use of coastal waters. Marinas, public access landings, private piers, and boat ramps all vie for space. Boating requires navigational space, a place to berth for some boat owners, and boat yards for repair and storage.

As population densities increase in these areas, greater pressures are exerted to develop remaining lands, and the demand for nuisance insect control on adjacent undeveloped wetlands either through chemical or physical (that is, ditching) methods, also intensifies.

In addition to residential and recreational development, other competing uses further contribute to the destruction or modification of wetland areas. Agricultural development can significantly affect wetlands. Common flood control measures in low lying coastal areas include dikes, ditches, and stream channelization. Wetland drainage is practiced to increase tillable land acreage. Wildlife management techniques that also destroy or modify wetland habitat include the construction of dredged ponds, low level impoundments, and muskrat ditches and dikes (USDC, 1985).

The NMFS priorities on the multiple use issues and threats to living marine resources were identified in the RAP document (USDC, 1985). Activities identified as high priority included urban and port development, ocean disposal, dams and agricultural practices. Medium priority activities included industrial waste discharges, domestic waste discharges, and OCS oil and gas development (Table 25).

6.4. PROGRAMS TO PROTECT, RESTORE, PRESERVE, AND ENHANCE THE HABITAT OF THE STOCKS FROM DESTRUCTION AND DEGRADATION

The MFCMA provides for the conservation and management of living marine resources (which by definition includes habitat), principally within the EEZ, although there is concern for management throughout the range of the resource. The MFCMA also requires that a comprehensive program of fishery research be

conducted to determine the impact of pollution on marine resources and how wetland and estuarine degradation affects abundance and availability of fish.

The MFCMA established Regional Fishery Management Councils that have the responsibility to prepare fishery management plans which address habitat requirements, describe potential threats to that habitat, and recommend measures to conserve those habitats critical to the survival and continued optimal production of the managed species. The NMFS Habitat Conservation Policy (48 *FR* 53142-53147), specifically Implementation Strategy 3, established the basis for a partnership between NMFS and the Councils to assess habitat issues pertaining to individual managed species.

Other NMFS programs relative to habitat conservation are found in the Marine Mammal Protection Act of 1972, the Endangered Species Act of 1973, and the Anadromous Fish Conservation Act of 1965. NMFS shares responsibilities with the FWS for conservation programs under these laws.

In addition to the above mentioned NMFS programs, other laws regulate activities in marine and estuarine waters and their shorelines. Section 10 of the River and Harbor Act of 1899 authorizes the Army Corps of Engineers (COE) to regulate all dredge and fill activities in navigable waters (to mean high water shoreline). Section 404 of the Clean Water Act of 1980 authorizes EPA to regulate the discharge of fill materials into waters and adjacent wetlands. EPA has delegated authority under Section 404 to the COE to administer all dredge and fill activities under one program. Section 401 of the Clean Water Act authorizes EPA, or delegated States with approved programs, to regulate the discharge of all industrial and municipal wastes. The EPA and COE also share regulatory responsibilities under the Marine Protection, Research, and Sanctuaries Act of 1972.

All of the activities regulated by these programs have the potential to adversely affect living marine resources and their habitat. NMFS, the FWS, and State fish and wildlife agencies have been mandated to review these activities, assess the impact of the activities on resources within their jurisdiction, and comment on and make recommendation to ameliorate those impacts to regulatory agencies. Review and comment authority is provided by the Fish and Wildlife Coordination Act of 1934 (as amended 1958) and the National Environmental Policy Act of 1969. Consultative authority extends to all projects requiring federal permits or licenses, or that are implemented with federal funds.

Other legislation under which NMFS provides comments relative to potential impacts on living marine resources, their associated habitats, and the fisheries they support include, but are not limited to, the Coastal Zone Management Act of 1972; the Marine Protection, Research, and Sanctuaries Act of 1972; and the Endangered Species Act of 1973 (Section 7 consultation).

A more detailed discussion of the pertinent legislation affecting their protection, conservation, enhancement, and management of living marine resources and habitat can be found in the NMFS Habitat Conservation Policy (48 *FR* 53142-53147).

In addition, NMFS and the other federal resource agencies are involved in other programs with the States (for example, NMFS Saltonstall-Kennedy and FWS Dingell-Johnson programs) that provide grants to conserve fish habitats and improve fisheries management.

Individual States also regulate wetlands, which complements federal habitat conservation programs.

6.5. HABITAT PRESERVATION, PROTECTION AND RESTORATION RECOMMENDATIONS

The Council is deeply concerned about the effects of marine and estuarine habitat degradation on fishery resources. It has a responsibility under the MFCMA to take into account the impact of habitat degradation on surf clams and ocean quahogs. The following recommendations are made in light of that responsibility.

1. All available or potential natural habitat for surf clams and ocean quahogs should be preserved by encouraging management of conflicting uses to assure access by the shellfish to essential habitat and maintenance of high water quality standards.

2. Ocean disposal of dredged material, even if non-toxic, must not occur where it can reach commercially harvestable concentrations of surf clams and ocean quahogs exist..

3. The disposal of sewage sludge, industrial waste, and contaminated dredged material in surf clam and ocean quahog habitat including the New York Bight should not be allowed. Advanced garbage, industrial waste, and sludge handling techniques are now available and must be encouraged. The Mid-Atlantic Fishery Management Council at its January 1988 meeting adopted measures to address specific problems of ocean dumping and endorsed the positions taken by the New England Council on this issue.

The combination of the Mid-Atlantic Council adopted measures and the endorsed New England Council measures present a reasonable course of action that should lead to resolution of the immediate illegal area dumping problems and the longer term environmental problems associated with ocean dumping.

The measures adopted or endorsed are:

a. The Council go on record in opposition to ocean dumping of industrial waste, sludge and other harmful materials.

b. The Council insists that appropriate agencies enforce all existing laws and regulations until ocean dumping ceases. Emphasis must be placed on prevention of short dumping and required release rates.

c. The Mid-Atlantic Council request EPA to require each permitted ocean dumping vessel be required to furnish detailed information concerning each trip to the dump site. This might be in the form of transponders; locked Loran C recorder plots of trip to and from the dump site; phone call to EPA when vessel leaves and returns to port; or other appropriate method to ascertain that vessels dump only in the 106 area and take legal action to abate illegal (short or improper) material dumping.

d. The Mid-Atlantic Council request fishermen and other members of the public to report to the EPA, Coast Guard and the Mid-Atlantic Council any observance of vessels dumping other than in the approved dump sites. A list of permitted vessels would accompany this request with the additional request for reporting of any vessel not on the approved list. The report should include date, time, location (longitude, latitude, Loran bearings), vessel name of the dumping vessel, the nature of the material dumped, name of reporting individual and vessel. This would enable EPA to take appropriate action against illegal dumping.

e. Direct the Mid-Atlantic Council's Executive Director to contact necessary Congressional delegations relative to strengthening current measures being considered to cease ocean dumping by a date certain.

f. The Council strongly urges state and federal environmental agencies to reduce the amount of industrial waste, sludge and other harmful materials discharged into rivers and the marine environment, and for these agencies to increase their surveillance, monitoring and research of waste discharge. The Council requests that the Environmental Protection Agency implement and enforce all legislation, rules and regulations with emphasis on the best available technology requirements and pre-treatment standards.

g. The Council take appropriate steps under the Magnuson Act and any other federal laws and regulations to assure the required responses to its concerns and opposition to dump site 106.

4. Mining for sand, gravel, and shell stock must not occur in or near (i.e. beds should not be subject to turbidity plumes) commercially harvestable concentrations of surf clams or ocean quahogs.

5. Extensive disruption of bottom sediments associated with oil and gas exploratory and production drilling and transport do occur and should be permitted only where attempts are made to minimize impacts on commercially harvestable concentrations of surf clams and ocean quahogs.

6. No toxic substances in concentrations harmful (synergistically or otherwise) to humans, fish, wildlife, and aquatic life should be discharged. The EPA's Water Quality Criteria Series should be used as guidelines for determining harmful concentration levels. Use of the best available technology to control industrial waste water discharges must be required in areas critical to the survival of surf clams and ocean quahogs. Any new potential discharge into critical areas must be shown not to have a harmful effect on surf clams or ocean quahogs.

7. The EPA and States should establish water quality standards in the coastal zone specifically with respect to the habitat requirements of surf clams and ocean quahogs.

8. The EPA should establish water quality standards for the EEZ sufficient to maintain edible surf clams and ocean quahogs.

9. Water quality standards should be enforced rigidly by State or local water quality management agencies, whose actions should be carefully monitored by the EPA. Where State or local management efforts (standards/enforcement) are deemed inadequate, EPA should take steps to assure improvement; if these efforts continue to be inadequate, EPA should reassume authority, as necessary.

10. The EPA should not allow any discharges of materials until the material is demonstrated by the discharger to be non-harmful to the marine environment.

6.6 HABITAT RESEARCH NEEDS

The new National Status and Trends Program of NOAA (USDC, 1987b) should assist in making intelligent decisions involving the use and allocation of resources in the nation's coastal and estuarine regions. These decisions require reliable and continuous information about the status and trends on environmental quality in the marine environment. Four general objectives have been established for the early years of the National Status and Trends Program (USDC, 1987b). Those objectives are (1) to establish a national data base using state of the art sampling, preservation, and analysis methodologies; (2) to use the information in the data base to estimate environmental quality, to establish a statistical basis for detecting spatial and temporal change, and to identify areas of the nation that might benefit from more intensive study; (3) to seek and validate additional measurement techniques, especially those that describe a biological response to the presence of contaminants; and (4) to create a cryogenic, archival specimen bank containing environmental samples collected and preserved through techniques that will permit reliable analysis over a period of decades. While the Council concurs with these objectives, efforts by this program or other NMFS programs also must look at specific issues which include:

1. It is necessary that scientific investigations be conducted on surf clams and ocean quahogs to emphasize the long term, synergistic effects of combinations of environmental variables on, for example, reproductive capability, genetic changes, and suitability for human consumption.

2. The Councils recommend the following areas for future habitat directed investigations: field studies on the direct and indirect effects of contaminants on mortality of surf clams and ocean quahogs; studies on the interactive effects of pH, contaminants, and other environmental variables on survival of surf clams and ocean quahogs; and continued studies on the importance of factors controlling the production and distribution of food items that appear in the diet of surf clams and ocean quahogs.

7. DESCRIPTION OF FISHING ACTIVITIES

7.1. DOMESTIC COMMERCIAL FISHERY

7.1.1. Total Landings

Total surf clam and ocean quahog landings more than doubled between 1967 and 1974, from 45 to 97 million lbs of meats (Table 2), with ocean quahogs contributing about 1 million lbs to the 1974 total. Total landings then dropped rapidly to about 55 million lbs in 1976 due to depletion of surf clam stocks, though quahog landings continued to increase. Since then, landings of surf clams and especially quahogs have generally increased, although there have been year to year fluctuations. Combined landings in 1987 were approximately 111 million lbs, a 10% decrease from the 1986 level, which was down 1% from the all time peak landings of 125 million pounds that occurred in 1985. Quahog catch comprised 45% of total clam meat landings in 1987, an increase from 36% in 1986.

7.1.2. Surf Clam landings

In 1950, 8 million lbs of surf clam meats were landed, with New York and New Jersey ports accounting for 97% of the total (Table 1). The Maryland fishery developed in the early 1950s, but New Jersey dominated the fishery until the early 1970s. Significant landings were first made in Virginia in 1972 when that state accounted for 37% of the total 64 million lbs landed. Since that time, New Jersey, Maryland, and Virginia have been the major harvesting states, although the share of total landings for each state changed from year to year (Table 1). Landings have been made in New England throughout the period since 1950, but these have been small relative to the total fishery; most years amounting to less that 0.5% of the total. New England's share gradually increased through the 1980's, however, and peaked at 14% in 1985 (Table 1).

The surf clam fleet typically concentrates its effort in one area until the catch rate declines, then moves to more productive grounds. Decreasing abundance of surf clams off New Jersey and discovery of large beds off Virginia resulted in a shift of effort to the latter area in the early 1970s. The introduction of mechanical shucking devices around 1970 greatly increased the capacity of processing plants. These devices, coupled with the expansion of the fishing grounds, are the major reasons for the industry's growth after 1970.

Surf clam landings peaked at approximately 96 million lbs in 1974, about 2.5 times the weight landed only a decade earlier (Table 1). After 1974, landings began to decline rapidly and, except for 1977, declined continuously to a low of 35 million lbs in 1979. The FMP was implemented in November, 1977, and the slight increase in surf clam landings that year, to about 52 million lbs, was due in part to greatly increased effort by the industry. There was a significant increase in the number of vessels which entered the fishery that year in anticipation of the stringent quota management and the vessel moratorium to be imposed by the FMP. Surf clam landings have risen steadily since 1979, averaging a 12.5% annual increase. The 1986 level of 79 million lbs was the highest since 1975 and was due in part to growth in New York inshore landings (Table 1). In 1987 total surf clam landings declined 23% to 61 million lbs, largely due to the depletion of the New York inshore stock. New York landings fell from 11.9 million lbs in 1986 to 2.4 million lbs in 1987 (Table 3).

7.1.3. Ocean Quahog Landings

Prior to the mid-1970s, the ocean quahog fishery was a small inshore industry operating out of Rhode Island ports. Annual landings through 1975 amounted to 2 million lbs or less (Table 2). Ocean quahog landings then increased from 6 million lbs in 1976 to 35 million lbs in 1979, and remained near that level through 1983 before increasing again to a peak of 52 million lbs in 1985. Ocean quahog landings in 1987 were 49 million lbs (Table 2). This rapid rise in landings was a result of an expansion of the fishery into the Mid-Atlantic area.

The Mid-Atlantic ocean quahog fishery began in 1976 (in New Jersey) and has grown rapidly since that date. The development of the fishery is attributable to advances in ocean quahog processing technology and the effects of surf clam quota management: the relatively high demand for clam meats unmatched by the allowable surf clam harvest and the excess harvesting capacity of the Mid-Atlantic surf clam fleet. The 1980 total catch of ocean quahogs, about 34 million pounds, was about 22 times greater than the average yearly catch for the decade prior to implementation of the Plan. Virtually the entire ocean quahog catch is now taken in the Mid-Atlantic area.

The ocean quahog share of total clam meat landings has thus increased significantly, from 4% or less between 1967 and 1975, to a peak of 50% in 1979. In 1987 ocean quahog landings constituted 45% of the total clam meat landings (Table 2). The significant increase in the ocean quahog share of total landings in the late 1970s came during a period of decreased surf clam landings (Table 2), but, when surf clam landings began to recover in 1980, the ocean quahog share decreased. As the surf clam harvest has leveled off in the last few years, rapid growth in landings has occurred with 1985 reaching a peak of 52 million lbs. Landings then dropped in 1986 to 45 million lbs of meats, probably due to the increased surf clam harvest from New York inshore waters. With the decline in surf clam landings in 1987, however, quahog catch again rose to the 50 million lbs level (Table 2).

7.1.4 EEZ Landings

Surf clam landings from the EEZ have continually dominated landings from state waters since 1971. The proportion of surf clam landings attributable to the EEZ was highest in 1971 at 95%, dipped to a low of 50% in 1975, and has averaged 80% from 1976 to 1987 (Table 2). EEZ surf clam landings since 1982 have approximated the annual quotas set by the Council. Reported catches were 93%, 108%, 103%, 97%, 103% and 92% of the 1982-87 quotas, respectively. Landings from the EEZ increased nearly continuously between 1980 and 1986 except for a 5% drop in 1985, to yield a 90% increase over the period (Table 2). Landings from the EEZ declined by 11% in 1987.

Reported (logbook) Mid-Atlantic EEZ landings for 1987 totaled 2.6 million bushels (about 43.4 million lbs), which comprised 91% of the total EEZ landings (Table 26). Nantucket Shoals Area landings for 1987 were 152,107 bu, 5% of the EEZ total (Table 27), while Georges Bank Area landings were 112,975 bu, 4% of the EEZ total (Table 28).

The EEZ ocean quahog fishery began in New Jersey in 1976 with a catch of 4 million lbs. The fishery grew rapidly to 32 million lbs in 1979 (Table 2) for reasons mentioned above. Landings were relatively stable at that level in the early 1980s, but increased 44% in 1985 to 52 million lbs, then declined 15% in 1986 to 44 million lbs. Landings rose 11% in 1987 to 49 million lbs. The EEZ catch has comprised nearly 100% of total ocean quahog landings since 1981.

Reported (logbook) EEZ ocean quahog landings in 1987 were 4.7 million bushels (Table 29). A bushel of quahogs in the shell yields 10 lbs of meat.

7.2. SURF CLAM VESSEL PERFORMANCE

7.2.1. Mid-Atlantic Area

Total Mid-Atlantic EEZ landings for 1987 were about 2.6 million bu, slightly less than the annual quota (Table 26). Average annual catch per vessel was 10,334 bu in 1979, peaked at 22,280 bu in 1984 and declined slightly to 19,209 bu in 1987. The number of vessels actively participating in the fishery (as recorded in log books) declined from 162 in 1979 to 113 in 1983. This accounted for part of the rise in average catch, but much of the effect was due to increasing stock abundance. After 1984, the number of active vessels increased to 135 in 1986 while landings held steady, accounting for the drop in average catch. There were 133 vessels active in the Mid-Atlantic area in 1987.

Average annual Mid-Atlantic surf clam vessel catch per unit of effort (CPUE) increased from 1979 through 1981, decreased in 1982, and increased every year from 1983 through 1986 (Table 26). In 1987, CPUE decreased to 191 bu/hr from the 1986 peak of 203 bu/hr. The increase in 1981 was due to catches dominated by small clams from the relatively strong 1976 and 1977 year classes off New Jersey and Delmarva, respectively. These small clams were targeted because of their very high abundance; traditionally, however, the fishery targeted on clams at least as large as the current minimum size limit. In 1982, CPUE decreased after implementation of the 5.5" minimum surf clam size limit effective 26 July 1981. In 1983 it began to increase because of increased availability of harvestable clams due to growth of the 1976 and 1977 dominant year classes and decreases in the minimum size limit. Average CPUE was 26 bu/hr in 1979 and 191 bu/hr in 1987. Conversely, the number of trips taken annually by the fleet has decreased by 55% over this same period, in response to effort restrictions.

CPUE has changed differently for each of the three vessel classes (Class 1 = less than 50 Gross Registered Tons, Class 2 = 51-100 GRT, and Class 3 = greater than 100 GRT). For Class 1 vessels, CPUE was 17 bu/hr in 1979 and 90 bu/hr in 1987, an increase of 430 percent (Table 26). Class 2 CPUE increased even more, from 21 bu/hr in 1979 to 155 bu/hr in 1987, an increase of 640 percent. Class 3 CPUE improvement was similar: 32 bu/hr in 1979 and 223 bu/hr in 1987, an increase of 600 percent. The proportion of total landings taken by each class has remained relatively constant over this period, however, with 4%, 33%, and 63% being the nine year average for Classes 1, 2, and 3, respectively.

7.2.2. Nantucket Shoals Area

Because of the small number of vessels fishing in the Nantucket Shoals Area (or at least submitting logbooks), only data for Class 3 may be published separately. The total number of vessels has varied considerably from a low of 6 in 1985 to 16 vessels in 1986 (Table 27). While fishing hours increased 300% from 1983 to 1987, landings increased only 75% (87,820 to 152,107 bu), resulting in a decline in average CPUE from 91 bu/hr to 40 bu/hr. Class 3 vessels took most of the clams in this area in 1983, but since then landings have been more evenly distributed.

7.2.3. Georges Bank Area

The Georges Bank Area has existed only since 1984. No Class 1 vessels have reported fishing in this area through 1987. While the number of vessels and hours fished increased between 1984 and 1985, landings decreased 16%, from 341,839 to 285,594 bu (Table 28). The decline in CPUE between 1984 and 1985 (126 to 86 bu/hr) led to a 50% drop in vessel participation for 1986 and an additional 40% drop in 1987. Although average CPUE rose to 149 bu/hr in 1986, the lower participation of vessels and fewer trips resulted in a 16% decline in landings. The low level of participation in 1987 led to a further 53% decrease in landings despite similar CPUE.

7.3. OCEAN QUAHOG VESSEL PERFORMANCE

Most of the ocean quahog vessels are typed as Class 3 (63% in 1979, up to 77% in 1987, Table 29). While Class 1 vessels have never reported landing ocean quahogs to a significant extent (a maximum of 4 vessels in 1980), Class 2 participation has been variable: a high of 19 vessels in 1979, a low of 7 in 1983 , and increasing again to 16 in 1987. The variability has likely been a result of severely restricted surf clam fishing time in the Mid-Atlantic Area. Fleet wide CPUE has exhibited little variation, averaging 129 bu/hr for the 1979-1987 period, with a low of 111 bu/hr in 1980, a high of 142 bu/hr in 1987.

7.4. MID-ATLANTIC SURF CLAM FISHING TIME

Though there are no time based effort restrictions in the Nantucket Shoals or Georges Bank areas, the FMP allows for a maximum surf clam fishing week in the Mid-Atlantic area of 96 hours. The hours of fishing may

be adjusted as necessary by the Regional Director to provide that the quarterly quotas are harvested and to minimize the chances of closures. Surf clam fishing effort in the Mid-Atlantic Area is thus regulated by adjusting the number of hours per week that vessels are permitted to fish.

Since the FMP was first implemented, allowable times ranged from 0 (closure) to 96 hours per week (Table 30), but these extremes have been the exception. The 96 hours per week period lasted for only 4 weeks in January 1978. While closures were fairly rare in the early years of the FMP, since December 1984 they have occurred about every 6 months.

During the period 1 January 1978 through 31 December 1986, of the total 460 weeks, 233 (51%) were at 24 hours per week, 86 (18%) were at 6 hours every other week, 57 (12%) were at 12 hours per week, 30 (7%) were at 36 hours per week, 26 (6%) were at 48 hours per week, 19 (4%) were accounted for by closures, and 4 (less than 1%) were at 96 hours per week (Table 31). The increasing incidence of closures is evidenced by the fact that 4 weeks were lost to closure in 1978, none in 1979 through 1983, 5 in 1984, 4 in 1985, and 6 in 1986.

Allowable fishing hours have been decreased from 1,752 hours in 1978 to 138 hours in 1986, a drop of 92 percent (Table 32). There has also been a general decrease in the time periods (that is, hours per week) during which fishing is allowed. In 1978, 60% of the hours were at 36 hours per week or more. By 1981 allowable hours decreased significantly to 100% at 24 hours per week or less. The rate was at 12 hours per week for most (66%) of 1984, and was entirely at 6 hours every other week for 1986, with a two week closure at the end of June and a four week closure in December. The precipitous decline in both annual hours and hours per week gives some indication of the harvesting capacity of the fleet relative to the quota.

In 1987, the timed based effort control system was altered to give vessel operators more flexibility in choosing fishing time. Rather than set the number of hours per week, the Regional Director set the number of allowable trips per quarter as estimated to be necessary to catch the quarterly quota. Vessel operators were required to schedule trips with NMFS NE Regional Office 10 days in advance with the following day available as a weather make up day if needed. Individual trips were still limited to six hours duration, however. The resulting number of allowable trips in 1987 was 25, with 5, 5, 7, and 8 allowed for quarters one through four, respectively. This method of choosing fishing days has been continued in 1988.

7.5. FLEET ACTIVITY

One way of assessing the level of participation in the fishery is to examine permit data, since each vessel must have a permit. There exist three categories of permits under the FMP, designated by NMFS with the following codes: an SF-1 permit allowing a vessel to harvest surf clams in all Areas and ocean quahogs (a permit issued pursuant to the moratorium), an SF-6 permit allowing it to harvest only ocean quahogs, and an SF-7 permit allowing it to harvest surf clams in the New England Area only (the Nantucket Shoals and Georges Bank Areas).

7.5.1. Number of Permits

Originally, 184 moratorium permits were issued in November 1977 upon implementation of the Surf clam/Ocean quahog FMP. A few of these permits were retired through inactivity though most of the reduction has resulted from consolidation at times of vessel replacement. Such replacement is allowed when it has been shown that a vessel has left the fishery involuntarily and some permittees have used the rule to upgrade to larger vessels by combining the permits of smaller vessels. As of the end of 1987, only 142 vessels remained with valid surf clam and ocean quahog permits (Table 33).

In contrast to the gradual decline in moratorium permits, the number of ocean quahog only permits increased dramatically from 63 in 1980 to 993 in 1987. Concurrently, the New England surf clam permits increased from 110 to 1183 (Table 34). This rapid expansion in the issuance of permits is misleading in gauging participation, however, in that many permittees have not exercised their fishing privileges.

In the New England surf clam and ocean quahog permit categories, and to a lesser extent for Mid-Atlantic surf clams, there have been significant differences between the number of vessels that are permitted and the number of active vessels. Of the 144 vessels with permits to land surf clams from the Mid-Atlantic Area as of the end of 1987, only 133 actually landed clams from this area during the year (Table 33). The participation rate (# active/# permitted) in the Mid-Atlantic area has averaged about 80% over the last ten years with lowest participation in 1983 (113 vessels) and increasing participation since then. While vessels permitted only to harvest ocean quahogs (SF-6) totalled 993 as of the end of 1987, only 3 of these vessels reported landing ocean quahogs in 1987 (Table 35). A similar participation rate is observed for the Nantucket Shoals

and Georges Bank Areas : only 8 vessels (Table 35) that did not have moratorium permits reported landings from these areas in 1987 compared to the 1183 vessels that had valid SF-7 permits (Table 34).

Obviously, most of the effort in the surf clam/ocean quahog fishery is directed by vessels with moratorium permits. Since so many additional vessels have permits but do not land the species for which they are permitted, it is likely they are engaged primarily in other fisheries. Upon examining permits of vessels in the ocean quahog only and New England Area surf clam only categories, there is a higher incidence of permits in other fisheries (for example, scallops, groundfish, lobster, and mackerel, squid, and butterfish) relative to the level of multiple permits possessed by moratorium vessels. The permit application form does include questions on gear that vessels carry and the principal area the vessel fishes, however. Most vessels are listed without gear appropriate for the ocean clam fisheries and are also listed as fishing primarily in the Gulf of Maine or Southern New England. Clearly, except for the permits issued pursuant to the moratorium, most of the remaining vessels have permits because little effort and no cost is involved in obtaining them.

7.5.2. Ownership Transfer of Permits

While the number of Mid-Atlantic Area surf clam permits is fixed by the moratorium implemented under the FMP, sale or purchase of these vessels is not prohibited. Since the permit is linked to the individual vessel, it is sold along with the vessel. Industry sources claim the capitalized value of a moratorium permit is included in the selling prices of vessels and is approximately $50,000, $100,000 and $150,000 for Class 1, 2 and 3 vessels, respectively.

There has been a moderate amount of ownership transfer between 1977 and 1987. The turnover rate has averaged 11.6 % from 1980-87, with the peak year in 1985 at 28.3% (Table 33). It is difficult to discern whether vessels undergoing change of ownership were indeed active at the time since some vessels may have been quahogging or undergoing repairs rather than retired from the fishery. Some speculative traffic in moratorium permits has undoubtedly occurred, however.

7.5.3. Fleet Composition

There have been significant changes to the Mid-Atlantic surf clam fleet over time (MAFMC, 1981). In 1965 there were 68 vessels; 33 Class 1, 33 Class 2, and 2 Class 3. Fleet size increased rapidly in the mid-1970s, to a peak of 162 active vessels in 1979, though more than this were actually eligible to fish. Much of the growth was in Class 3, with 81 vessels in this class during 1979. Class 2 numbers also increased to 65 vessels while Class 1 decreased slightly to 31 vessels. Though the total fleet size has declined since 1979 through consolidations, Class 3 has remained a high percentage. Of the 142 permitted vessels in 1987, 13 were Class 1, 52 Class 2, and 77 Class 3 (NMFS, permit files).

7.5.4. Fishing Effort

With changes between the surf clam and ocean quahog categories and the creation of several surf clam management categories, it becomes important to consider the participation of vessels in the several categories. The largest portion of the active fleet, those with moratorium permits, have concentrated largely on Mid- Atlantic Area surf clams only, 121 vessels in 1979 (Table 35). Since 1983, however, there has been an increase in the number of vessels that fish for both surf clams and ocean quahogs. In 1979, 51 vessels (including non-moratorium permits) reported landing both surf clams and ocean quahogs (Table 35). That number fell continuously to 29 in 1983, followed by a rapid rebound to 67 vessels in 1987. The number of vessels fishing for quahogs only or New England surf clams only has remained consistently low relative to the activity of the moratorium fleet in spite of the dramatic expansion in permit issues.

Since 1985, both ocean quahog trips and ocean quahog landings (bushels) have exceeded surf clam trips and surf clam landings (Tables 26 and 29) owing to the high participation rate in the two fisheries by the moratorium fleet. For example, in 1987, vessels operating in both categories reported landing about 1.5 million bushels of Mid-Atlantic Area surf clams and about 4.3 million bushels of ocean quahogs. Comparison with total ocean quahog activity indicates that vessels fishing in both categories accounted for 67 of the 71 vessels landing ocean quahogs (94%) and landed 91% of the reported catch. From the opposite perspective, these vessels accounted for 67 of the 133 vessels landing Mid-Atlantic Area surf clams (50%), and 57% of the catch (Table 35). Clearly, the two fisheries are becoming increasingly integrated in the harvesting sector.

7.5.5. Vessel Age

Another issue significant to the fleet is the age of vessels and associated safety considerations. The relatively advanced age of the fleet is due to restrictions on vessel replacement for Mid-Atlantic area surf clam permittees, and to the hesitation on the owners part to invest in new vessels given the current degree of

overcapitalization. Year of construction was found for vessels with moratorium permits and for ocean quahog and New England Area permits in either the NMFS permit file or the publication *Merchant Vessels of the US* (USCG, 1981).

Of the 142 moratorium permitted vessels with construction dates recorded, 14% were aged ten years or less, 37% were aged 11 to 20 years, 32% were built between 21 and 40 years ago, and 17% were built more than 40 years ago (Table 36). The average age was 27 years with a minimum of one year and a maximum of 122. For the non-moratorium vessels with construction dates reported, 25% were built 10 or less years ago, 17% were aged 11-20 years, and 58% were between 21 and 31 years old. The average age was 19 years with a minimum of 4 and maximum of 31. Clearly, vessels restricted by the moratorium replacement rule are older than unconstrained vessels. Whether this means that vessel safety is being compromised by the replacement rule depends on the degree of hull and equipment maintenance performed annually.

7.6. RECREATIONAL FISHING ACTIVITIES

The surf clam and ocean quahog fisheries are commercial fisheries only. There are no records of recreational catches of either species in the United States.

7.7. FOREIGN FISHING ACTIVITIES

The surf clam and ocean quahog fisheries are domestic fisheries only. There are no records of foreign (including Canadian) catches of either species in the northwest Atlantic.

8. DESCRIPTION OF ECONOMIC CHARACTERISTICS OF THE FISHERY

8.1. DOMESTIC HARVESTING SECTOR

8.1.1. Surf Clam Ex-vessel Value and Price

Surf clam ex-vessel value for the period 1950-87 peaked at approximately $43 million in 1986 (Table 37). Dockside value decreased to $28 million in 1987 due to lower landings as well as depressed prices. The decline in landings from the 1986 level was primarily attributable to the depletion of the extensive New York inshore clam beds which were harvested in 1985 and 1986 (Table 1). Processed product inventories remained high well into 1987, however, resulting in lowered prices for surf clams from all areas.

On a state by state basis, ex-vessel revenue has been distributed in a pattern similar to landings (Tables 1, 37), indicating prices are consistent throughout the range of the fishery. New Jersey ex-vessel revenues have long dominated those of other states except for a short period in the early seventies when Virginia revenues were highest (Table 37).

Annual average surf clam price was driven up dramatically in 1976, attributable to uncertainties in market response to short supplies. The shortfall of shellstock was due to depletion of Delmarva stocks and an anoxia kill off New Jersey. Since then, nominal price has been relatively stable except for periods in 1983 and 1987 when increasing quantities were absorbed by the market. After adjusting for inflation, it is evident that real price has declined steadily since the price shock in 1976 (Figure 38).

8.1.2. Ocean Quahog Ex-vessel Value and Price

Ocean quahog landings and value increased significantly from 1976 to 1987. Annual landings reached an all time peak in 1985, with a nominal value of $16 million (Table 38). In most years, over 90% of quahogs are taken from the EEZ. The steady increase in ex-vessel value from 1975 to 1987 is mainly attributable to the sustained rise in landings over that time frame, since price remained remarkably stable at around $3.00/bu, but fell to about $2.90 in 1987 (Figure 39).

Ocean quahog price is likely linked to surf clam prices since the rise in 1976 coincided with the rise in surf clam price. Also, annual average real price exhibited a similar decline to that of surf clams (Figure 39). Availability of surf clams greatly affects demand for quahog meats since surf clams are more highly valued and substitutable in most product forms (Section 8.3.4). Though ocean quahog permits have not been limited by the FMP, the limited number of processors, the dynamics of the contracting process (Section 8.2.6), and the low price of quahogs have effectively restricted quahogging to a supplemental activity for those permitted to harvest Mid-Atlantic surf clams. The fact that surf clam price seems to be unaffected by the ten year increase in quahog landings suggests limited substitutability for surf clams along with a growing demand for clam

products. The closer the substitutability between them, the more a change in the price of one will affect the price of the other.

8.2. COSTS AND REVENUES OF VESSEL OPERATION

8.2.1. Vessel Characteristics

With the implementation of the Surf Clam and Ocean Quahog FMP in 1977, 184 vessels were issued permits (SF-1) for the surf clam fishery pursuant to the coastwide moratorium on entry of new vessels into the fishery. Retirements from the fishery and consolidation (several vessels involuntarily retiring from the fishery and their permits being put on a new vessel) has reduced this to 142 permits in 1987, though only 133 of these were active in the Mid-Atlantic area as recorded in logbooks (Table 34). Over half the fleet also fishes for ocean quahogs when not fishing for surf clams, depending, most likely, on surf clam price and effort controls and access to a quahog market (Table 35). Although valid permits for "Ocean Quahogs Only" (SF-6) and "New England Surf Clams Only" (SF-7) each numbered about 1,000 in 1987 (Table 34), less than ten vessels in each permit category were active as recorded in logbooks (Table 35).

The vessels in the surf clam fleet vary tremendously with respect to their physical characteristics. In 1987 the tonnage per vessel ranged from 24 to 466 tons, with an average of 125 tons. Vessel length ranged from 45 to 160 feet, with an average of 82 feet. The horsepower of the surf clam vessels ranged from 135 to 1530, with an average of 504. Crew size ranged from 2 to 12, with an average of 5. The size of dredges ranged from 36 to 200" with an average length of 106" (however, many vessels carry two 120" dredges). A total of 16, 57 and 84 vessels were grouped in Classes 1, 2 and 3, respectively.

8.2.2. Catch Concentration

As in most fisheries, the distribution of catch is not uniform across all vessels. Even vessels with similar physical characteristics often have markedly different catch rates, owing to the skill and experience of the captain and crew. Fishermen who consistently land catches above the fleet average are termed "highliners".

Logbook records indicate that a major share of the catch of both surf clams and ocean quahogs has been landed by a minor portion of the fleet. When 1979-87 catches are totalled by vessel, 34 vessels, or only 22% of the fleet, landed 50% of the surf clams (Table 39). Catch is even more concentrated for quahogs, where 13 vessels, or only 11% of the fleet, landed 50% of the catch.

8.2.3. Domestic Harvesting Capacity

Appendix I of Amendment #2 contained a review of possible harvesting capacity for surf clams and ocean quahogs and estimated that the 1978 harvesting capacity was approximately 247 million pounds. Although the number of vessels with permits in the Mid-Atlantic Area surf clam fishery (which are also valid for fishing in the New England Area for surf clams and coastwide for quahogs) has been reduced by 23% since then, the numbers of New England surf clam and ocean quahog permits have increased dramatically (Table 34). The potential harvesting capacity has not increased commensurate with the increase in permitted vessels, however, since many vessels do not carry dredges and do not intend to harvest surf clams and ocean quahogs.

The combined quotas of surf clams and ocean quahogs is currently approximately 110 million pounds of meats. The 1987 EEZ combined catch was approximately 98 million pounds (Table 2), but this was due to limited fishing time for surf clams (only 25 trips were allowed) and probable market saturation for quahogs. It seems reasonable to conclude that US harvesting capacity for surf clams and ocean quahogs combined is significantly in excess of probable quotas. The intent of US fishermen to use that capacity depends on demand, but is no less than current quotas for surf clams and ocean quahogs.

8.2.4. Costs and Revenues of Vessel Operation

In order to evaluate the benefits of this Amendment, it was necessary to estimate the costs and earnings for the various segments of the fleet. Three obvious categories include those vessels which fish: only for surf clams, only for quahogs, or for both species in a given year. Many vessels will shift back and forth between clams and quahogs depending on whether they have access to a market, current price levels, and whether they have used their allotted number of EEZ surf clam trips.

The following sections detail how cost and revenue estimates were made, with summary results presented in Tables 40 and 41.

8.2.4.1. Revenues from vessel operation

Revenue estimates were relatively straightforward in that they were mostly comprised of averaging recent performance data from vessel logbooks for each of the three vessel size classes. (Class 1 = 0 - 50 gross tons; Class 2 = 51 - 100 gross tons; Class 3 = 101 + gross tons.) Total revenue was defined as the average catch per trip multiplied by the average number of trips and the average price of the catch.

This analysis focused on the economics of surf clam and ocean quahog harvesting in the EEZ. While it is recognized that revenues are earned by vessels in the State inshore fisheries, insufficient data were available on this subset of the fleet for meaningful analysis.

In 1987, Class 1 vessels averaged 428 bushels per trip for surf clams in the EEZ, and did not participate in the ocean quahog fishery. Class 2 vessels averaged 808 bushels per trip for clams, and 1,078 bushels for quahogs. Class 3 averaged 1,274 bushels for clams, and 1,456 bushels for quahogs.

The number of EEZ trips made for each species was averaged from 1987 logbook data. For example, among those vessels fishing only for surf clams, Class 1 vessels took an average of 14 trips per year, Class 2 vessels took an average of 21 trips per year, and Class 3 vessels took an average of 20 trips per year. (Recall that these vessels may also be harvesting clams in inshore waters.)

Average 1987 prices for surf clams and quahogs taken from the EEZ were $8.01 per bushel for surf clams and $2.89 per bushel for quahogs (USDC, 1988b). These prices are significantly lower for both species than in recent years, representing an 18% drop for surf clams and a 4% drop for quahogs relative to 1986. At least in part this was due to large inventories of clams which built up from the discovery of large beds of surf clams in Long Island Sound, which were harvested from late 1985 through 1986. Prices paid to fishermen in 1988 have not changed substantially, however, with October surf clam prices averaging around $8.00 per bushel and ocean quahog prices around $2.90 per bushel (Brey, pers. comm.).

Annual total revenues from surf clam and ocean quahog harvests in the EEZ were calculated at approximately $528,000 for Class 1 vessels, $8,355,000 for Class 2, and $27,400,000 for Class 3. Combined these bring the annual value of the EEZ fisheries to just over $36 million in 1987. Tables 40 and 41 detail these earnings on an individual vessel basis for vessels which fished only for surf clams, and those which shift between clams and quahogs in a given year. Data for vessels fishing only for quahogs may not be published because the small number of vessels involved (1 in Class 2 and 2 in Class 3) would violate confidentiality regulations regarding their landings.

Inshore fisheries were also carried out for surf clams in the States of Massachusetts, Rhode Island, New York, and New Jersey. Massachusetts harvested 42,000 bushels in 1987, with a total of 30 vessels permitted to fish (it is not known how many of the 30 actually fished). In Rhode Island, three vessels harvested 52,000 bushels in 1987. During the same year in New York, 141,000 bushels were harvested by 20 vessels. In New Jersey in 1987, 57 permitted vessels harvested 466,000 bushels (Table 3). At an average price of $7.13 per bushels for inshore surf clams, the total value of the surf clam inshore fishery was just over $5 million in 1987. When added to the fleet revenue from EEZ trips, this brings the total value of these fisheries to over $41 million for 1987.

8.2.4.2. Vessel operating costs

8.2.4.2.1. Introduction

Cost data from many sources were solicited by the Council staff for preparation of this Amendment. Individual fishermen provided confidential information on the vessels they owned, which was then combined with other data provided from employees of the National Marine Fisheries Service (Kurkul, pers. comm.). Council staff pooled and modified these data in order to obtain averages for the three vessel classes as presented in the following sections.

8.2.4.2.2. Variable operating costs

Variable costs are those which vary with the level of output of an enterprise. For a fishing vessel, variable costs include such items as fuel, crew wages, food for the crew, and supplies which are necessary in the actual harvesting process.

Fuel costs were estimated on three bases to reflect the varying amounts of fuel used while at the dock, steaming, and actually fishing. Fuel used at the dock (pre and post trip) was estimated by multiplying the number of trips by the engine horsepower by six hours by a factor of 0.02 [Fuel at Dock = (No. Trips) x (Engine HP) x (6 Hours) x (0.02)] Fuel used steaming to and from the beds was estimated by multiplying the

number of trips by the engine horsepower by the hours steaming by a factor of 0.04 [Fuel Steaming = (No. Trips) x (Engine HP) x (Hours Steaming) x (0.04). Fuel used fishing was estimated by multiplying the number of trips by the sum of the main engine and pump engine horsepower by the hours fishing by a factor of 0.05 [Fuel Fishing = (No. Trips) x (Main engine HP + Pump engine HP) x (Hours Fishing) x (0.05).

Total gallons consumed from all phases was then multiplied by $0.60 per gallon to arrive at the total fuel cost. The $0.60 price was quoted after rebate of the $0.15 federal tax on fuel consumed on the roadways.

In order to generate average prices for each class which could be used in the above formulas, data on the 1987 fleet was averaged for the engine and pump horsepower variables. Average hours steaming and fishing on either clam trips or quahog trips was calculated from 1987 logbook data, as well as for the numbers of trips taken for each class.

Wages paid to the captain and crew of clam vessels are typically a direct percentage of the gross revenue, or "gross stock." This percentage can vary from a low of 25% to a high around 40%. An average figure of 33% was used for this analysis.

The cost of food consumed by the crew over the course of a trip was estimated at $11 per crewman per trip.

Expenses for equipment which is used extensively (or used up) in the process of fishing was estimated using a formula based on the number of hours the vessel actually fished:

Gear, Supplies & Repairs = (0.15) x (Engine HP + Pump HP) x (Hours Fishing)

Summed across all cost categories for the 1987 fleet, total annual variable costs come to approximately $281,000 for Class 1 vessels, $4,308,000 for Class 2, and $18,025,000 for Class 3. This brings the estimated grand total of variable costs to under $23 million per year for operations in the EEZ surf clam and ocean quahog fisheries.

8.2.4.2.3. Fixed costs

Fixed costs are those which vessel owners incur regardless of whether the vessel is in operation or not, and, hence, will not vary with "output" or catch. The following list comprises those included in this analysis. Since several of the fixed costs were calculated based on the estimated value of the hull, an explanation of how this value was derived is provided.

Initial estimates of hull value were made in Amendment 3 based on vessel gross tonnage as follows:

Tonnage	Value
0-25	$ 50,000
26-50	100,000
51-75	150,000
76-100	200,000
101-125	300,000
126-150	400,000
151-175	500,000
176-200	600,000
201-300	700,000
301 +	800,000

These values were updated based on the age of the vessel: if built before 1981, add 25%; from 1981 through 1983, add 50%; from 1984 on, add 100%. With these updates for the 1987 fleet, average prices for each class were estimated as: $129,000 for Class 1; $263,000 for Class 2; and $628,000 for Class 3.

Average hull insurance costs were estimated as 5.5% of the value of the hull. Using the above hull values, they equal: $ 7,100 for Class 1; $14,500 for Class 2; and $34,500 for Class 3.

Personal and Indemnity insurance costs were estimated to average $4,000 per crewman.

Estimates of haul out and periodic maintenance costs were set at $20,000, $30,000, and $40,000, respectively, for Classes 1, 2, and 3. The interval over which this occurs varies among owners, but is generally from one to two years. An average haul out cycle was therefore set at 1.5 years, and the above estimates prorated to annual costs of $13,200, $19,800, and $26,400 for the three classes.

Administrative expenses were estimated at 2% of gross revenue.

Professional services (such as legal and accounting) were estimated at $5,000 per vessel.

Docking fees were averaged at $200 per month or $2,400 per year.

Miscellaneous expenses such as telephone and travel were set at $3,000 per vessel.

Interest was estimated assuming a 10% rate on a 15 year mortgage. With a 20% down payment requirement, interest payments would be made on 80% of the value of the hull. For a Class 1 vessel, therefore, 80% of $129,000 hull value would entail $103,200 being financed and total finance charges of $96,400, or $6,400 per year. For a Class 2 vessel, 80% of $263,000 hull value equals $210,400 being financed and total finance charges of $196,600, or $13,100 per year. For a Class 3 vessel, 80% of $628,000 hull value equals $502,400 being financed and total finance charges of $469,400, or $31,300 per year.

Depreciation was calculated as a straight line over thirty years. Average hull values for each class were divided by 30. Note that the intention here is to reflect the real loss in asset value which occurs over the life of a vessel, not a figure derived for tax purposes. In 1988, the average vessel age in the fleet was 25 years. As with other durable assets such as buildings, much of the actual depreciation can be offset by a conscientious maintenance program. Using this method, annual depreciation was estimated at $4,300 for a Class 1 vessel; $8,800 for a Class 2 vessel; and $20,900 for a Class 3 vessel.

Summed across all cost categories for the 1987 fleet, total annual fixed costs come to approximately $598,000 for Class 1 vessels, $4,690,000 for Class 2, and $11,644,000 for Class 3. This brings the estimated grand total of fixed costs to just under $17 million per year for the fleet.

8.2.4.3. Net revenues from vessel operations

Utilizing the cost and revenue calculations from the previous sections, net revenue estimates for the existing fleet are:

	Class 1	Class 2	Class 3
Total Revenue	528,000	8,355,000	27,400,000
Variable Costs	-281,000	-4,308,000	-18,025,000
Fixed Costs	-598,000	- 4,690,000	-11,644,000
Net Revenue	-351,000	-643,000	-2,269,000

Summing across vessel classes, these estimates show net losses from the EEZ fisheries to be in the neighborhood of $3.2 million, clearly a poor showing on gross receipts of just over $36 million. It is important to remember that these figures do not include earnings from the inshore fisheries, which for many of the Class 1 vessels will mean the difference between a loss for the year and a modest profit. Second, earnings can be expected to be off in 1987 with nominal prices for surf clams and ocean quahogs the lowest they have been since 1983 and 1981, respectively (Figures 38 and 39). Third, all the figures presented thus far represent generalized "average" vessels; better captains who have higher landings and lower costs will be making a profit. Correspondingly, others who are either less skilled, have difficulty in finding a market, or are saddled with a higher vessel mortgage rate will be operating at a greater loss.

This picture is clouded somewhat from the vertically integrated nature of several fleets within the fleet as a whole. Corporations which own processing plants as well as vessels may choose to run their vessels at a loss for tax purposes and make their profits from processing operations. This is easily done by simply paying company vessels less for their catch than they otherwise might. When value statistics are later reported to the government, these practices will have the effect of undervaluing the profitability of the fleet.

Another major factor involves the fact that costs were applied across the fleet. Some operators defer maintenance, minimize insurance, and use other methods to defer or eliminate costs in order to produce apparent profits.

It must also be remembered that the analysis was prepared using 1987 information.

Such complicating factors aside, however, it is clear that overcapitalization of the fleet is severely depressing net revenues through unnecessarily high fixed costs. It is the principal goal of this Amendment to provide incentives to reduce overcapitalization.

8.2.5. Employment on Vessels

McCay and Creed (1987) examined the crewing history of vessels engaged in the surf clam/ocean quahog fishery. The study consisted of interviews (1987) with industry participants and examination of the NMFS

license and logbook files (updated through 1986). An issue of concern has been whether or not crew consolidation is taking place as a result of the current time based management system.

In the study, crew was defined as non-owner captains, mates and deck hands. Crew share is a major operating expense in commercial fisheries and liability insurance, another major expense, is directly related to crew size. Under the current surf clam FMP, time based effort restrictions cause vessels to be tied up for considerable periods of time. Owners of more than one vessel can therefore rotate a single crew among vessels if none are fishing simultaneously.

Interview data indicated that such consolidation is in fact occurring, though not due to cost cutting efforts on the part of vessel owners. Rather, it is due to lack of interest in the unsteady employment available on vessels fishing only intermittently each quarter. When interview data were compared to NMFS license data, mean crew size (here meaning total crew/total vessels rather than crew per vessel trip) dropped to 3.7/vessel from 4.6/vessel (significant at $P = .05$). Additionally, owners of more than one vessel had lower crew sizes per vessel than for owners of single vessels (2.85 vs 3.58), indicative that consolidation is possible with fleets but reducing crew size on individual trips is not feasible (McCay and Creed, 1987).

Consolidation would have been greater had not more vessels diversified by ocean quahogging. Interview data revealed that owners not quahogging were experiencing greater difficulty attracting crew because of fewer total fishing trips. Crew per vessel was higher for those vessels also quahogging (significant at $P = .01$). The quahogging alternative is restricted for independents, however, since the glut in supply has sharply reduced quahog purchases from independents by processors with their own vessels. Employment on processor owned vessels was thus higher than that for independents (4.05/vessel) though this also reflects the larger size of quahog vessels.

The recent (since early 1987) increased flexibility in choice of fishing days should enable more consolidation for processor owned and independent fleets because more coordination of trips and crew will be possible. Despite this, total crew employment in the industry has not been drastically reduced, due to the labor demands for quahog fishing. It is thus likely that crew recruitment will become increasingly difficult for independents but easier for processors with vessels and a good outlet for quahog meats.

Where consolidation does occur, it will likely have its most pronounced effects on those individuals employed as captains, since opportunities for their specialized skills are limited in alternative fisheries. Deck hands may be able to move more freely to shoreside labor and craft occupations, though interview responses indicated their preference for surf clam and ocean quahog fishing stemmed from the higher wages available.

According to McCay and Creed (1987), the implications for proposed regulatory changes to the surf clam FMP that would allow consolidation of vessels are:

1. Crew consolidation will likely be accelerated, though it is currently occurring under the time based effort controls anyway.
2. Despite some dislocation in employment, crew remaining in the industry will experience greater stability in employment and higher wages.
3. Displaced captains are more likely to be adversely affected than deck hands since the non-monetary benefits of clamming are greater and the alternative trade opportunities fewer, relative to those for deck hands.

8.2.6. Relationship Among Harvesting and Processing Sectors

In this industry, fishermen enter into an agreement with a processor to sell a certain quantity of clams or quahogs, and then harvest and deliver them. Price is known in advance. If a fisherman is unwilling to fish at that price, he can contract with another processor or not fish.

Generally, the processors do not sell a final product and several processors may be attempting to sell product to the same buyer. Therefore, although there are only a few large processors, they may not be able to control their selling price.

A consideration relative to management is the extent of vertical integration within the industry. Increasing shares of the quota can be harvested by vessels owned or closely associated with processors, leaving independent vessels with decreasing opportunities to participate in the fishery. This has been most evident since 1987, when the Regional Director began setting the number of quarterly trips allowed per vessel, rather than the allowable fishing hours. It has been claimed by industry participants (comments at council meetings) that vertically integrated processors are not contracting with independent vessels so that the

quarterly quota is not reached, thus enabling processors to use their own vessels when additional trips are authorized to make up the shortfall in landings.

8.3. PROCESSING SECTOR

Statistics on surf clam and ocean quahog production are aggregated as a result of: (1) data availability; (2) the need to maintain confidentiality; (3) the high degree of double counting which occurs when clams are shucked at one plant and transformed into prepared products at another plant (reported total processed product production for 1986, when converted to live meat weight equivalents, is 176% higher than the actual total landings of surf clams and ocean quahogs); (4) failure to maintain data code distinctions as to species, when surf clams are mixed with quahogs and/or inshore surf clams in the course of processing; and (5) the fact that processed output poundage is reported in terms of total product net weight (including batter, breading, or other ingredients added to prepared products) and must be converted back to live meat weight poundage to get a common unit of comparison between product lines.

8.3.1. Number of Plants, Production, and Employment

The number of surf clam and ocean quahog processing plants in each state has remained relatively constant from 1976-1986, with most activity concentrated in New Jersey and Virginia (Table 42). A small shift from NJ to VA is evident over this time frame and reflects the slight decline in NJ landings from 1978-80 (Table 1). There had been about a 20% decline in the total number of plants processing surf clams and ocean quahogs since 1976 until a resurgence of activity in Maine and Massachusetts brought the total back up in 1986 (Table 42).

Despite the high number of plants processing surf clams and/or ocean quahogs in the New England and Mid-Atlantic regions, most are not high volume. Of the 46 plants processing surf clams or quahogs in 1986, more than half (26) processed less than 1% of the combined total plant output for clams. Since 1978, there has been an increase in the number of plants which are processing both species (Table 42). This reflects the rapid rise in ocean quahog landings relative to surf clams over this period (Table 2) and the fact that more plants are specializing in processing clam meats. Specialization is evidenced by the increasing proportion of plant revenue attributable to surf clam and ocean quahog processing (Table 43). Though surf clam processing still accounts for a greater relative share of plant revenue, gains are most notable for ocean quahogs, averaging 20% of industry-wide total plant revenue in recent years. Growth in total plant output and revenue is attributable in large measure to increased ocean quahog processing (Table 43).

Employment related to clam processing was estimated from total plant employment and the ratio of clam revenue to total plant revenue. This assumes that processing of non-clam products is comparably labor intensive and that both clam and non-clam products are similarly priced. Industry wide, clam related employment increased from about 1700 workers in 1976 to just over 3000 in 1985, keeping in step with increased clam output (Table 44). Though estimated employment decreased 18% from 1985 to 1986, this may be an artifact of the estimation method and due to price increases for non-clam products, since production and revenue for clam products did not decline to such an extent.

8.3.2. Processed Product Categories

Historically, the principal finished product lines for all clam products have been canned clam chowders, whole and minced clams, breaded clam products, and canned sauces and juices. Surf clam based products have comprised the vast majority of the total US production of these four product groups. However, since 1976, quahog meats have been increasingly used as a substitute for surf clams in some of these products. In 1976, quahog based products comprised about 2% of the value of all clam product production, but by 1986, this percentage has grown to 28% of the value of all clam finished product production (Tables 43 and 44).

The output of the surf clam/ocean quahog plants includes both intermediate and final products. The intermediate products are fresh and frozen shucked surf clam and ocean quahog meats. These meats are typically then further processed into a variety of finished product forms, including canned clam chowder, canned whole and minced clams, canned sauces, canned juices, and breaded products. Surf clam meats are usually processed to recover strips for breaded products and the remainder or "salvage" is used for chowders and sauces. Generally, quahogs have not been successfully used in the breaded strip lines due to their lower meat yield relative to surf clams. In 1986, less than 1 percent of quahogs by value were processed in this manner, compared to almost 22% of surf clams (Table 45). The fact that breaded products command the highest prices per pound greatly underscores the industry's need for a steady supply of large surf clams, since these products can only be made from surf clam meats.

Though surf clam and quahog meats are physically substitutable in all but breaded products, quality differences enable surf clam meats to be sold at a premium relative to quahog meats. For example, canned chopped quahogs receive about 25% less per case than canned chopped surf clams (Marvin, pers. comm.). Investment in clam processing plants and equipment is likely predicated on higher value surf clam products. Given the lower meat yield of quahogs and the lower value of finished product, quahog processing is in most cases viewed as supplemental to surf clam processing.

The method of raw material acquisition differs among those plants that produce finished products. Some finished product plants produce their own shucked output which is used in their own finished product forms. Some of the same plants also offer some of this shucked output for sale to other finished product plants. Some finished product plants apparently acquire all of their shucked raw material from those plants that produce only shucked output and those that produce both finished and shucked output.

In order to avoid problems of double counting, it is more meaningful to examine finished production only, rather than total production (which includes the intermediate product). Since the finished products are measured in a large variety of ways, i.e., gallons, various sizes of cases, and pounds, it is useful to examine the trends in production in terms of total value overall and by product groups. Trends in value of output for the various intermediate and finished products indicate most significant growth in canned clam meats (Table 46). This reflects the sustained increase in quahog landings over this time period since 35% of quahog product by value is marketed in this form (Table 45).

8.3.3. Processing Sector Capacity

About 2,820,000 bushels or 90% of the 1987 surf clam quota (all areas combined) of 3,150,000 bushels was harvested (Tables 26,27,28). When considering only the Mid-Atlantic area, the harvest rate equaled 96% of the 2,650,000 bushel quota (Table 26). The 1987 ocean quahog quota of 6,000,000 bushels was harvested at a lower rate of about 79% (Table 29), most likely limited by market saturation rather than harvesting or processing capacity constraints. Processor survey data for 1986 indicate that 46 plants (Table 42) handled 124 million pounds of clam meats (Table 2), including both surf clams and ocean quahogs from both state waters and the EEZ. Since there has been no significant reduction of capacity in the processing sector since 1985, when 40 plants handled 125 million pounds of clam meats, it seems reasonable to conclude that processing capacity is greater than the combined quotas for surf clams and ocean quahogs which currently amount to about 114 million pounds.

8.4. INTERNATIONAL TRADE

Data are not available to identify international trade in surf clams and ocean quahogs specifically, though information exists on trade in generic clam meats. Imports of clam meats reached a record 17.6 million pounds in 1987, while exports were about 1.2 million pounds (USDC 1988b). Given current domestic demand for clams, as evidenced by the balance of trade in clam products, it is not likely that allowable surf clam and ocean quahog harvests will accommodate development of an export market.

9. FISHERY MANAGEMENT PROGRAM

9.1. MEASURES TO ATTAIN MANAGEMENT OBJECTIVES

9.1.1. Specification of OY, DAH, DAP, Annual Quota, JVP, and TALFF

9.1.1.1. Surf clams

The annual Optimum Yield (OY), Domestic Annual Harvest (DAH), Domestic Annual Processing (DAP), and annual quota for surf clams equal between 1,850,000 and 3,400,000 bu (approximately 31.5 - 57.8 million lbs of meats).

Prior to the beginning of each year, the Council, following an opportunity for public comment, will recommend to the Regional Director quotas and estimates of DAH and DAP within the ranges specified. In selecting the quota the Council shall consider current stock assessments, catch reports, and other relevant information concerning: exploitable and spawning biomass relative to the OY; fishing mortality rates relative to the OY; magnitude of incoming recruitment; projected effort and corresponding catches; geographical distribution of the catch relative to the geographical distribution of the resource, and status of areas previously closed to surf clam fishing that are to be opened during the year and areas likely to be closed to fishing during the year. The quota shall be set at that amount which is most consistent with the objectives of this FMP. The Regional Director may set quotas at quantities different from the Council's recommendations only if he can demonstrate that the Council's recommendations violate the national standards of the MFCMA and the

objectives of this FMP. It is the Council's intent that this quota setting process will not involve the preparation of an FMP amendment and a Supplemental Environmental Impact Statement to establish the annual quota.

Since OY, DAH, and DAP are specified as equal to each other, joint venture processing (JVP) and total allowable level of foreign fishing (TALFF) equal zero. Hence, fishing for surf clams in the EEZ by any vessel other than a vessel of the US is prohibited.

9.1.1.2. Ocean quahogs

The annual OY, DAH, DAP, and quota for ocean quahogs range between 4.0 million bushels and 6.0 million bushels (approximately 40 - 60 million lbs of meats). The annual quota and estimates of Domestic Annual Harvest and Domestic Annual Processing for ocean quahogs will be developed following the procedures described in section 9.1.1.1 for surf clams.

Since OY, DAH, and DAP are specified as equal to each other, JVP and TALFF equal zero. Hence, fishing for ocean quahogs in the EEZ by any vessel other than a vessel of the US is prohibited.

9.1.2. Specification of Preferred Management Measures

9.1.2.1. Permits and fees

Two permits are needed to fish for and land surf clams and ocean quahogs. One permit is a fishing vessel permit and the other is an allocation permit. Vessels taking surf clams or ocean quahogs for personal use are exempt from this requirement. Personal use is defined as the harvest of surf clams or ocean quahogs for use as bait, for human consumption, or for other purposes (not including sale or barter) in amounts not to exceed two bushels per person per trip.

Processors and dealers are also required to obtain a permit.

The federal costs of annual permit systems for vessels, processors, and dealers shall be charged to permit holders as authorized by section 303(b) (1) of the Magnuson Act. In establishing the annual fee, the NMFS Regional Director will ensure that the fee does not exceed the administrative costs incurred in issuing the permit, as required by section 304(d) of the Magnuson Act. Proper accounting for administrative costs will include labor costs (salary and benefits of permitting officers plus prorated share of secretarial support and supervision at both the NMFS regional and headquarters levels), computer costs for creating and maintaining permit files (prorated capital costs, time share and expendable supplies), cost of forms and mailers (purchase, preparation, printing and reproduction), and postage costs for application forms and permits.

9.1.2.2. Vessel permits

Any vessel of the United States is eligible for a fishing vessel permit. Vessels previously in the fishery must have submitted all required logbook reports as of the date of the application.

The Regional Director may establish fees for the fishing vessel permit.

Fishing vessel permit applications are processed by the Regional Director. The application form shall require provision of at least the following information: names, addresses, and telephone numbers of the owner and operator; the name of the vessel; the vessel's US Coast Guard documentation number or State license number; engine and pump horsepower; home port of the vessel; directed fishery or fisheries; fish hold capacity (in cages or bushels); dredge size; and number of dredges. The vessel owner or operator is required to notify NMFS of any changes of address or physical characteristics of vessels.

A fishing vessel permit is valid only for the vessel for which it is issued.

The fishing vessel permit must be carried, at all times, on board the vessel for which it is issued, and must be maintained in legible condition. The permit, the vessel, its gear and catch shall be subject to inspection upon request by any authorized official.

Fishing vessel permits expire on 31 December of each year.

Vessel owners or operators who apply for a fishing vessel permit must agree as a condition of the permit that all the vessel's fishing, catch and gear (without regard to whether such fishing occurs in the EEZ or landward of the EEZ and without regard to where such surf clams, ocean quahogs, or gear are possessed or landed) will be subject to all the requirements of Federal regulation; provided, however, that owners and operators of vessels engaged in surf clam or ocean quahog fisheries exclusively within water under the jurisdiction of any State which prescribes minimum sizes or requires cage tags shall not be bound by conflicting Federal minimum size or tagging regulations. This permit condition does not relieve the owner or operator of a Federally

permitted vessel from any State or local requirements respecting the fishing for, catch of, or gear used to catch or retain surf clams or ocean quahogs. If a requirement of the Federal regulations and a requirement of State law differ, except for measures respecting minimum sizes and cage tagging in States which require either, any vessel owner or operator permitted to fish in the EEZ must comply with the more restrictive requirement. This measure does not preempt State regulations. It is a mechanism to facilitate enforcement by precluding the argument that an untagged cage of surf clams or ocean quahogs was harvested in State waters. An untagged cage of surf clams or ocean quahogs is deemed to be part of the vessel's allocation and not in compliance with Federal regulations.

Vessel permits may be suspended, revoked, or modified by the Regional Director for violations of this FMP.

9.1.2.3. Processor/Dealer Permit

Any processor or dealer of surf clams or ocean quahogs must have a permit maintained at their principal place of business.

An applicant must apply for a Processor/Dealer permit in writing to the Regional Director. The application must be signed by the applicant and submitted to the Regional Director at least 30 days before the date upon which the applicant desires to have the permit made effective. Applications must contain the name, principal place of business, mailing address and telephone number of the applicant. The Regional Director will notify the applicant of any deficiency in the application. If the applicant fails to correct the deficiency within 15 days following the date of notification, the application will be considered abandoned.

Except as provided in Subpart D of 15 CFR Part 904, the Regional Director will issue a permit within 30 days of the receipt of a completed application.

A permit expires on December 31 of each year or if the ownership or the dealer or processor changes.

Any permit issued under this section remains valid until it expires or is suspended or revoked or ownership changes.

Any permit which is altered, erased, or mutilated is invalid.

The Regional Director may issue replacement permits. Any application for a replacement permit shall be considered a new permit.

A permit is not transferable or assignable. It is valid only for the person to whom it is issued.

The person to whom a permit is issued under this section must maintain it at his/her principal place of business. The permit must be displayed for inspection upon request by an authorized officer or any employee of NMFS designated by the Regional Director.

The Administrator may suspend, revoke, or modify, any permit issued or sought under this section. Procedures governing permit sanctions or denials are found at Subpart D of 15 CFR Part 904.

The Regional Director may, after publication of a notice in the Federal Register, charge a permit fee.

Within 15 days after the change in the information contained in an application submitted under this section, the person issued the permit must report the change in writing to the Regional Director.

9.1.2.4. Allocation permits

9.1.2.4.1. General provisions of allocation permits

Surf clams and ocean quahogs must be landed pursuant to an allocation permit. An allocation permit takes the form of (1) an individual allocation certificate specifying the percent share of the annual surf clam and/or ocean quahog quota the allocation is worth, (2) surf clam and/or ocean quahog cage tags equivalent to the cages resulting from applying the individual allocation to the annual quota, and (3) any documentation issued by NMFS concerning the transfer of individual allocations and cage tags.

The Regional Director may establish fees for the allocation permit; that is, issuing the allocation permit document, issuing the annual allocation of cage tags, and issuing any documentation concerning the transfer of cage tags and allocations. Authorization to charge administrative costs includes allowing the Regional Director to arrange for cage tags to be produced and distributed by a specified vendor.

Only persons qualified to own permitted fishing vessels under United States law are eligible to own allocation permits. This is intended to apply the provisions of 46 USCS 121 and any related laws to allocation permits,

which wound mean that for a corporation to own an allocation permit a majority of voting shares in the corporation would need to be owned by citizens of the United States.

Information concerning allocation permits is considered public information since it is information given to the fishermen by NMFS rather than information received from the fishermen, which is specified by the Magnuson Act as confidential.

Allocation permits may be suspended, revoked, or modified by the Regional Director for violations of this FMP.

9.1.2.4.2. Issuance of allocation permits

Within two calendar quarters following implementation of this Amendment, allocation permits will be issued to owners or operators of permitted vessels which harvested surf clams or ocean quahogs (based on logbook reports) between 1 January 1979 and 31 December 1988. The amount of the initial distribution (that is, the percentages shown on the individual allocation permit) of surf clams will be based on the following formula.

For vessels with permits to fish for surf clams and ocean quahogs in any Area (that is, vessels with permits issued pursuant to the moratorium; permits designated by NMFS as SF-1) the initial surf clam distribution will be based on the following formula:

a. The surf clam catch (in bushels) that each permitted vessel caught (based on logbook reports) for calendar years 1979, 1980, 1981, 1982, 1983, 1984, 1985 (counted twice), 1986 (counted twice), 1987 (counted twice), and 1988 (counted twice) will be determined.

b. The worst two years will be deleted from each vessel's history. The resulting number (in bushels) will be summed for the entire fleet and each vessel's ratio of the total calculated.

c. The cost factor (vessel length x width x depth) of each vessel will be calculated, summed for the fleet, and each vessel's ratio to the total calculated. The vessel's historical ratio contributes 80% to the vessel's initial allocation. The cost factor contributes 20% to the vessel's initial allocation.

For vessels with permits to fish for surf clams in only the New England Area (permits designated by NMFS as SF-7) the surf clam catch will be the average of the catch for the years actually fished between 1979 and 1988, inclusive. The lowest catch year will be deleted from each vessel's history. This number (in bushels) will be included in the total for the total surf clam fleet (moratorium and New England Area only) to calculate the individual vessel's ratios. They will then be included with the moratorium vessels in the above allocation.

For purposes of calculating historical participation, vessels that have replaced other vessels will be credited with the catch of the vessels they replaced.

The amount of the initial distribution (that is, the percentages shown on the individual allocation) for ocean quahogs will be based on the following formula:

a. The average ocean quahog catch (in bushels) that each permitted vessel caught (based on logbook reports) for those years the vessel actually reported landings for calendar years 1979 through 1988, with the vessel's lowest catch year not counted, will be determined.

b. The sum of all of the vessels' averages will be divided into each vessel's average to calculate each vessel's ratio to the total.

c. The ratio will be applied to each year's annual quota to calculate each vessel's annual allocation.

Prior to issuing the initial allocation permits, the Regional Director will inform each vessel owner or operator of the data upon which the allocation will be based (for example, logbook reports and/or vessel dimensions from the US Coast Guard documentation records). Owners or operators will have 30 days to document if any of these data are incorrect and need to be changed. The logbook submitted is the official document and cannot be changed or submitted after the due date as a basis of seeking a change in allocation. An error by NMFS in compiling the original report is a basis for change.

Once the final annual quotas for surf clams and ocean quahogs have been published by the Regional Director for any year, NMFS will calculate the number of cage tags by applying the appropriate percentages (from the individual allocation) to the annual quota for each species. These bushel allocations will then be divided by 32 (bushels per cage) to yield the appropriate number of cages for which cage tags may be issued. The cage tags are valid only for the calendar year for which they are issued. Surf clam tags may not be used on cages

containing ocean quahogs and ocean quahog tags may not be used on cages containing surf clams. Clearly, it is necessary for the Regional Director to develop tags which are significantly different between the two species, in order to facilitate enforcement.

There are no restrictions on the permissible use of the quota (that is, an owner does not have to harvest his or her share) or on the time of harvest other than it must be landed by a permitted vessel during the year for which the tags were issued. An owner may obtain a permitted vessel to harvest his or her allocation or he or she may contract for the allocation to be caught by any permitted vessel. However, the allocation may be reduced by NMFS for violations of the MFCMA.

9.1.2.4.3. Transfer of allocation permits

The ownership of an allocation may be transferred in amounts not less than 160 bushels (i.e., 5 cages) to any person eligible to own a documented vessel under the terms of 46 USC 12102. A written application must be submitted to the Regional Director specifying the number of bushels to be transferred and the new owner at least 10 days before the applicant desires the transfer to be effective. Transfers may not be made between 15 October and 31 December of each year. The transfer is not effective until the new owner receives an allocation permit from the Regional Director.

9.1.2.5. Effort restrictions

Fishing for surf clams and ocean quahogs is permitted seven days per week.

9.1.2.6. Closed areas

It is unlawful to fish for surf clams or ocean quahogs in any designated closed surf clam or ocean quahog area.

If areas are identified as being contaminated by the Regional Director or the Food and Drug Administration, due to the presence or introduction of hazardous materials or organisms or pollutants, they may be closed by the Regional Director.

Areas may be closed to surf clam and ocean quahog fishing upon a determination by the Regional Director (based on logbook entries, processors' reports, survey cruises, and other information) that the area contains surf clams of which 60% or more are smaller than 4.5" in size and not more than 15% are larger than 5.5" in size. Sizes shall be measured at the longest dimension of the surf clam. This determination will be based on a recommendation by the Council.

The Regional Director may hold a public hearing on the proposed closure or reopening of any area under this section. The Secretary will publish notice of any proposed area closure or reopening, including any restrictions on harvest in a reopened area. Comments on the proposed closure or reopening may be submitted to the Regional Director within 30 days after publication. The Secretary will consider all comments and publish the final notice of closure or reopening, and any restrictions on harvest, in the Federal Register. Any adjustment to harvest restrictions in a reopened area will be made by Federal Register notice. The Regional Director will send notice of any action under this paragraph to each surf clam or ocean quahog processor and to each surf clam or ocean quahog permit holder.

If the Regional Director determines as the result of testing by State, Federal, or private entities that a closure of an area due to the presence or introduction of hazardous materials or organisms or pollutants is necessary to prevent any adverse affects fishing may have on the public health, he may close the area for 60 days without a prior public hearing. If an extension of the 60 day closure period is necessary to protect the public health, the hearing and notice requirements of paragraph (c)(1) will be followed.

The Regional Director shall publish notice of any closed area in the *Federal Register*. The Regional Director shall send notice of the closed area to each surf clam or ocean quahog processor and to each surf clam or ocean quahog vessel owner or operator.

Areas or portions of closed areas may be reopened to fishing when the average clam length in the dominant (in terms of weight) size class has reached 4.75" in length or if the yield or rate of growth of the dominant size class in the area to be reopened would be significantly enhanced through selective, controlled, or limited harvest of surf clams in the area, if appropriate given all relevant biological, environmental, and economic considerations, . The Council's Scientific and Statistical Committee will review available data and make a recommendation to the Council for a reopening. The Council may also consult the Surf Clam and Ocean Quahog Advisory Subpanel. The Council will then make a recommendation to the Regional Director. The Regional Director may hold a public hearing on the reopening prior to making a final decision. Reopening decisions

will be made so that the anticipated yield from a reopened area will be accounted for in the development of the annual quota.

9.1.2.7. Size restriction

There is a surf clam minimum size limit of 4.75", which is the size of maximum yield per recruit. There is a tolerance of 50 undersized clams per cage. If any cage is in violation of the size limit, the entire load is deemed in violation.

The surf clam minimum size limit may be suspended on a year to year basis unless 30% of the clams (based on a review by the Council of discard, catch, and survey data) are smaller than 4.75" (size of maximum yield per recruit) and the overall reduced size was not attributable to beds where growth of the individual clams had been reduced because of density dependent factors. It is the Council's intent that the size limit suspension would generally be in effect when the vast majority of the surf clams were larger than maximum yield per recruit size and would generally not be in effect when there were large numbers of small surf clams as a result of sets of large year classes. This analysis would be carried out as part of the annual quota setting process.

9.1.2.8. Specification and sources of pertinent fishery data

9.1.2.8.1. General

The reporting requirements are intended so that the Council and NMFS may acquire accurate data on the surf clam and ocean quahog catch, disposition of such catch, effort in the fishery, and importance of surf clams and ocean quahogs relative to other species. These data are necessary to manage the fishery for the maximum benefit of the United States. It is necessary that reporting be as comprehensive as possible. The following are designed to meet this need. If it is determined that the Secretary does not have the authority to mandate reporting of catches from the territorial sea, alternative methods of securing that data must be developed.

9.1.2.8.2. Processors and dealers

Processors shall provide at least the following information to the Regional Director on a weekly basis on forms supplied by the Regional Director: dates of purchases or receipt; name, permit number, and mailing address; number of bushels purchased or received, by species; cage tag numbers; allocation permit number; name and permit number of the vessel from which surf clams or ocean quahogs are landed or received; price per bushel, by species; mailing address of dealer or processing plant; size distribution; and meat yield per bushel by species.

Dealers shall provide at least the following information to the Regional Director on a weekly basis on forms supplied by the Regional Director: dates of purchases or receipt; permit number and address; allocation permit number;cage tag numbers; name and permit number of the vessel from which surf clams or ocean quahogs are landed or received; price per bushel, by species; date of sale; and disposition of surf clams or ocean quahogs, including name and permit number of entity to whom the surf clams or ocean quahogs were sold and provide those reports to the Regional Director on the same frequency basis.

The processor shall make the report available for inspection by an authorized officer, or by an employee of the NMFS designated by the Regional Director to make such inspections, at any time.

For one year after the date of the last entry in the report, processors and dealers shall keep each report at the processor's or dealer's principal place of business.

Processors are also required to submit at least the following information to the Regional Director on an annual basis on forms supplied by the Regional Director: number of processing plant employees during each month of the year just ended; number of employees processing surf clams and ocean quahogs, by species, by month; total payroll for surf clam and ocean quahog processing, by month; plant capacity to process surf clam and ocean quahog shellstock, or to process surf clam and ocean quahog meats into finished products, by species; and projected capacity to process surf clams and ocean quahogs, by species, for the following year.

If the capacities described in paragraph above change more than ten percent during any year, the processor shall promptly notify the Regional Director of the change in capacity.

Violations of these requirements shall be subject to the penalties provided for in the MFCMA.

9.1.2.8.3. Owners and operators

The owner or operator of any vessel with a permit in the surf clam or ocean quahog fishery shall maintain on a daily basis an accurate log for each fishing trip, on forms supplied by NMFS showing at least: name and permit number of the vessel; total amount in bushels of each species taken; date(s) caught; time at sea; duration of fishing time; locality fished; quantity of surf clams or ocean quahogs discarded; crew size; crew share by percentage; landing port; cage tag numbers; date sold; price per bushel; buyer; and allocation permit number. The owner or operator shall make the log available for inspection by an authorized official at any time during or after a trip. The owner or operator shall keep each logbook for one year after the date of the last entry in the log. The owner or operator shall submit copies of logbook forms weekly to the Regional Director.

The Regional Director shall revoke, modify, or suspend the permit of a vessel whose owner or operator falsifies or fails to submit the records and reports prescribed by this section.

9.1.2.9. Other measures

All surf clam and ocean quahog cages shall be tagged before the cable is removed from the cage on the dock and tags shall not be removed until cages are emptied at the processing plant. Information to be shown on the tags shall be determined by the Regional Director, in consultation with the Council, but will include at least the information needed to establish a chain of evidence adequate for enforcement of the surf clam minimum size limit and the vessel allocation system from the vessel through the transportation system to the processor, inclusive. The Regional Director shall determine the minimum specifications of the tags, which as a minimum shall assure that markings are not erased prior to the cages being emptied at the processing plant. Tags for surf clam cages must be significantly different from tags for ocean quahog cages, in order to facilitate enforcement.

The Regional Director may allow the shucking of surf clams or ocean quahogs at sea if he determines that an observer carried aboard the vessel can measure accurately the total amount of surf clams and ocean quahogs harvested in the shell prior to shucking. Any vessel owner may apply in writing to the Regional Director to shuck surf clams or ocean quahogs at sea. The application shall specify: name and address of the applicant; permit number of the vessel; method of calculating the amount of surf clams or ocean quahogs harvested in the shell. vessel dimensions and accommodations; and length of fishing trip. The Regional Director will provide an observer to any vessel owner whose application is approved. The owner will pay all reasonable expenses of carrying the observer on board the vessel. The observer shall certify at the end of each trip the amount of surf clams or ocean quahogs harvested in the shell by the vessel. Such certification shall be made by the observer's signature on the daily fishing log.

Based on the recommendation of the Council, the Regional Director may allow shucking at sea of surf clams or ocean quahogs if he determines a conversion factor for shucked meats to calculate accurately the amount of surf clams or ocean quahogs harvested in the shell. The Regional Director will publish a notice in the Federal Register specifying a conversion factor together with the data used in its calculation for a 30 day comment period. After consideration of the public comments, and any other relevant data, the Regional Director may publish a final notice specifying the conversion factor. If the Regional Director makes this determination, he may authorize the vessel owner to shuck surf clams or ocean quahogs at sea. Such authorization shall be in writing and be carried aboard the vessel. The observer shall certify at the end of each trip the amount of surf clams or ocean quahogs harvested in the shell by the vessel. Such certification shall be made by the observer's signature on the daily fishing log.

All surf clams and ocean quahogs landed in cages that do not have tags issued by a State government are assumed to have been caught in the EEZ, must have a Federal cage tag, and are subject to the Federal surf clam minimum size limit.

No person shall possess a cage containing any surf clams or ocean quahogs without a tag from prior to the time the cable is released from the cage at the dock until the cage is emptied.

A standard cage measures 3' x 4' x 5', which amounts to 60 cubic feet. Therefore, a tag is required for every 60 cubic feet or portion thereof of a cage containing clams or quahogs. Cages larger than 60 cubic feet require one tag for every 60 cubic feet, or portion thereof, of capacity used (for example, two tags for greater than 60.01 cubic feet to 120 cubic feet).

No person shall possess a tagged cage not containing surf clams or ocean quahogs. Tags removed from emptied cages shall be disposed of in the method prescribed by the Regional Director.

The Regional Director may require that vessel owners or operators notify NMFS in a manner and timing established by the Regional Director before a vessel departs the dock on a trip to harvest surf clams and ocean quahogs and before the vessel reaches the dock from a trip on which surf clams or ocean quahogs were caught.

No person shall catch, take, possess, or retain on board any surf clams or ocean quahogs from closed areas.

No person shall possess, have custody of or control of, ship, transport, offer for sale, deliver for sale, sell, purchase, import, export, or land, any surf clams or ocean quahogs which were taken in violation of the Act or any regulations issued under the Act.

No person engaged in the surf clam or ocean quahog fisheries as an owner or operator, or as a dealer, processor or buyer shall unload or cause to be unloaded, or sell or buy, any surf clams or ocean quahogs, without preparing and submitting the documents required by the regulations.

No person shall refuse to permit an authorized officer to board a fishing vessel, processing plant, or holding area subject to such person's control for purposes of conducting any search, no matter where that vessel may be situated, in connection with the enforcement of the Act or any regulations issued under the Act; forcibly assault, resist, oppose, impede, intimidate or interfere with any authorized officer in the conduct of any search or inspection; resist a lawful arrest for any act prohibited by the regulations; or interfere with, delay, or prevent, by any means, the apprehension or arrest of another person knowing that such person has committed any act prohibited by the regulations.

Any person or vessel found to be in violation of these regulations, including the logbook and other reporting requirements, shall be subject to the civil and criminal penalty provisions and forfeiture provisions prescribed in the Act and pertinent regulations. It is recommended that the Secretary establish a specific list of penalties for specific civil violations of these regulations in order to expedite resolution of violations. The allocation system proposed in this Amendment would dramatically change the nature of violations, since fishing hours and days (for example) would be replaced with allocations. Violations would likely involve the use and misuse of cage tags. Penalties would need to be changed accordingly, and would include permit sanctions. Depending on the violation, sanctions could be placed against the captain (fines), the vessel owner or operator (fine, forfeit of catch and associated tags, suspension of vessel permit, and vessel seizure), and individual allocation/cage tag owner (fine). It is intended that if one cage is in violation, all cages on board are subject to sanction and that each cage in violation will constitute a separate offense.

Each fishing vessel 25 feet in length or greater subject to these regulations shall display its official number on both sides of the deckhouse or hull, and on an appropriate weather deck. Vessels under 25 feet in length do not need to display any number. The official number is that number issued by the US Coast Guard associated with the documentation of the fishing vessel or the official number issued by a State or the US Coast Guard for undocumented vessels. Such markings shall be at least 18" in height and be legibly painted in a contrasting color. The operator of each vessel shall keep the required markings clearly legible and in good repair and insure that no part of the vessel, its rigging or its fishing gear obstructs the view of the markings from an enforcement vessel or aircraft. Vessels licensed under State law shall use the appropriate vessel identification markings established by that State.

The owner or operator of any vessel subject to these regulations shall immediately comply with instructions issued by authorized officers to facilitate boarding and inspection of the vessel for the purpose of enforcing the Act and the regulations. Upon being approached by a Coast Guard cutter or aircraft, or other vessel or aircraft authorized to enforce the Act, the vessel shall be alert for signals conveying enforcement instructions. Standard signals and requirements should be developed and implemented by regulations.

No person shall alter, erase, or mutilate, or steal any permit issues pursuant to this FMP.

No person shall alter, erase, or mutilate, or steal any cage tags issued pursuant to this FMP.

No person shall land surf clams or ocean quahogs in containers other than cages.

Loss or theft of permits and tags must be reported to the Regional Director by telephone immediately and in writing within 24 hours.

No person shall submit false information in records and reports required to be kept and filed by this FMP.

9.2. ANALYSIS OF BENEFICIAL AND ADVERSE IMPACTS OF PROPOSED MANAGEMENT MEASURES

9.2.1. The FMP Relative to the national standards

Section 301(a) of the MFCMA states: "Any fishery management plan prepared, and any regulation promulgated to implement such plan ... shall be consistent with the following national standards for fishery conservation and management." The following is a discussion of the standards and how this FMP meets them:

9.2.1.1. Conservation and management measures shall prevent overfishing while achieving, on a continuous basis, the optimum yield from each fishery.

The Amendment does not change the MSYs, OYs, or quota setting process and, therefore, does not alter the FMP's consistency with this standard. Overfishing is defined as the catch of surf clams or ocean quahogs exceeding the annual quota for each species. The provisions of the FMP concerning setting annual quotas, making vessel allocations, requiring cage tags, minimum size limit, closed areas, and reporting will prevent overfishing.

9.2.1.2. Conservation and management measures shall be based upon the best scientific information available.

This FMP is based on the best and most recent scientific information available. Data used include NMFS logbook and permit files and the most recent stock assessments.

9.2.1.3. To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.

The Amendment improves the FMP's consistency with this standard since the surf clam fishery would be subject to the same regulations throughout the range of the resource in the EEZ, a situation that has not existed since 1980 (because of the creation of the New England Area in Amendment #2).

Hence, it seems appropriate to consider a measure that would combine the surf clam management areas rather than measures that would continue the three existing areas. Available information shows that there is no "New England" surf clam fishery separate from the general fishery. Mid-Atlantic based vessels have made a major contribution toward the landings of clams from the Nantucket Shoals and Georges Bank Areas. With the time based management system that has operated in the Mid-Atlantic Area, vessels would fish in the Nantucket Shoals and Georges Bank Areas only if there trips were not needed in the Mid-Atlantic, or between their Mid-Atlantic Area trips. With vessel allocations replacing the time based system and the combination of allocations, many vessels will be surplus in the Mid-Atlantic and will be free to fish in the Nantucket Shoals and Georges Bank Areas if the separation is continued. This would have a negative impact on those New England based vessels that fish that area.

Enforcement of vessel allocations in one Area, trip limits in another, and no regulations except a quota in the third, when all of the clams enter the same market and vessels may fish in all three Areas would be chaos. Vessels could claim fishing in Nantucket Shoals or Georges Bank in order to catch more than an allocation. Coast Guard resources would not be adequate to track the actual fishing grounds used by each vessel.

9.2.1.4. Conservation and management measures shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such a manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

The FMP does not discriminate among residents of different States. It does not differentiate among US citizens, nationals, resident aliens, or corporations on the basis of their State of residence. It does not incorporate or rely on a State statute or regulation that discriminates against residents of another State.

Additionally, the FMP removes the different management systems for the Mid-Atlantic, Nantucket Shoals, and Georges Bank Areas, thus making all clam fishermen subject to the same rules. The allocation system is based largely on the fishermen's reported catch, so it is fair and equitable. The allocation system is intended to encourage merger of vessel allocations on the newer vessels, thus saving costs, and thereby promoting conservation of resources. The history based allocation system assigns shares based on performance, so individuals do not gain or lose in terms of excessive shares relative to history.

The FMP is rationally connected with the achievement of OY in that, by allowing overall industry efficiency to improve, it allows for improvements in harvesting practices. The FMP furthers the FMP objectives. By elimi-

nating the time based effort limitation system, it should stabilize harvest rates while minimizing short term economic dislocations (objective 1). It clearly simplifies the management regime (for example, no more fishing hours, fishing days, bad weather make up day), thereby working to achieve objective 2. By allowing combinations of vessel quotas and bringing the entire fishery (all surf clams and ocean quahogs) under limited entry management, it provides an opportunity for the industry to operate efficiently and bring harvesting capacity in balance with processing and biological capacity (objective 3). Because many of the very structured regulations are eliminated, the system becomes more flexible, thus achieving objective 4.

The allocation formula is "fair and equitable" since it is based almost completely on each vessel's reported catch relative to the catch of the total fleet. The Council made an estimate of the relative benefits and hardships imposed by the allocation and compared its consequences with those of alternative allocation schemes, including the status quo (Appendices 1 and 2).

The Council has modified the allocation formula as it applies to Mid-Atlantic permitted vessels to take into account breakdowns, loss of markets, and recent investment and participation in the fishery. The allocation formula as it applies to vessels permitted to fish for surf clams in New England and for ocean quahogs has been modified so as not to penalize vessels that suffered breakdowns or entered the fishery for only part of a fishing year.

The allocation formula promotes conservation by encouraging a rational, more easily managed use of the resource and by optimizing the yield, in terms of economic or social benefit of the resource.

Fishermen will be able to reduce the waste in the fishery represented by the high discard rate experience in a time limited fishery as they are able to search out beds of larger surf clams at their leisure. The Amendment will promote conservation in the quahog fishery by preventing the waste that will occur as vessels come to be constrained by the quahog quota either naturally or as the result of an arms race to garner larger shares of the resource as the basis for a future allocation had the Council opted to impose only a moratorium on this fishery at this time.

Since the allocation formula is based largely on reported catch, allocated shares of fishing privileges generally mirror historical participation. The Council does not believe that the FMP will create conditions fostering inordinate control, by buyers or sellers, than would not otherwise exist.

The allocation formula has taken into account present participation in the fishery by using logbook reported catch as the prime determinant of the allocations and, for the Mid-Atlantic surf clam vessels, weighting the allocation in favor of the most recent years.

The allocation formula has taken into account historical fishing practices in, and dependence on, the fishery by using data as far back as 1979 in calculating vessel shares while on the other hand weighting more recent years more heavily and also using the vessels size (length x width x depth) as a proxy for investment, thereby reflecting dependence on the fishery.

The allocation formula has taken into account the economics of the fishery, primarily by allocating clams in all areas and also quahogs, since logbook records indicate that virtually all vessels fishing for ocean quahogs also fish for surf clams and that on many occasions Mid-Atlantic vessels have fished in the New England Area.

The allocation formula has taken into account the capability of fishing vessels used in the fishery to engage in other fisheries. This is one of the main reasons for including all areas and quahogs in the allocation system. While clam vessels could not likely be used for trawling, if an allocation system were developed only for the Mid-Atlantic, the excess capacity could be employed in the quahog fishery and in the New England surf clam fishery, thereby creating negative economic impacts.

The allocation formula has taken into account the cultural and social framework relevant to the fishery by creating a system that applies to the entire industry. It recognizes that a long term solution to the harvesting capacity problem must be found. It recognizes that clammers are dependent on the clam fishery (that is, generally, it is difficult, if not impossible to use clam vessels in other fisheries).

The FMP has been recommended by the Plan Review Team, who also recommended that historical catch should largely be the basis for allocations. The Council's Scientific and Statistical Committee has for years recommended that ocean quahogs be included in the program in a manner similar to surf clams.

9.2.1.5. Conservation and management measures shall, where practicable, promote efficiency in the utilization of the fishery resources; except that no such measure shall have economic allocation as its sole purpose.

The management regime is intended to allow the fishery to operate at the lowest possible cost (e.g., fishing effort, administration, and enforcement) given the FMP's objectives. The FMP places no restrictions on the use of efficient techniques of harvesting, processing, or marketing. The vessel allocation system for surf clams eliminates the relatively inefficient time based effort limitation system and replaces it with a system that allows operators to use a fishing strategy best suited to their operation. The allocation system for ocean quahogs permits that fishery to go directly to an efficient level of operations before problems associated with time based effort limitation and gross excesses of harvesting capacity develop. The advantages of the allocation system are discussed above under national standard 4.

9.2.1.6. Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.

The Amendment does not alter the FMP's consistency with this standard. The historical catch basis for allocation takes into account and allows variations in catch. The annual quota setting process allows for adjustments to catch levels in response to the condition of the resources.

9.2.1.7. Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

The FMP represents a major step in the reduction of regulation and the costs of both fishing and administration.

The time based effort limitation system, which sets fishing days and times and requires at sea enforcement, is eliminated. This reduces costs to industry and government.

9.2.2. The FMP Relative to MFCMA Section 303(b)(6)

The Magnuson Act, at section 303(b)(6), invests the Council with the discretion to limit access to a fishery in order to achieve optimum yield. The Act directs the Council to consider present participation in the fishery, historical fishing practices in, and dependence on, the fishery, the economics of the fishery, the capability of fishing vessels used in the fishery to engage in other fisheries, the cultural and social framework relevant to the fishery, and any other relevant considerations. The Council first exercised its discretion to limit access to the surf clam fishery in 1977, when a moratorium on new entrants into the fishery in the Mid-Atlantic area was imposed. At this time, the abundance of the resource in New England was highly speculative, and the fishery was not being exploited for all intents and purposes. Consequently, the moratorium was not extended to this area. Any vessels in New England that met the criteria for a moratorium permit retained the right to fish in the Mid-Atlantic area.

At the time the moratorium was imposed, the Council made a conscious decision not to impose restrictions on vessel modifications (based on legal advice that such restrictions could not be placed into effect until the Secretary approved the FMP) except on vessels replacing those that involuntarily left the fishery (for example, sank). These vessels had to have similar harvesting capacity to the vessel being replaced. However, once the replacing vessel had a permit issued to it, the owner could modify it without restriction. Unfortunately, the tremendous fishing capacity of the fleet in excess of that needed to harvest the annual quota caused vessel owners to increase the capacity of their vessels to catch clams within the time constraints of the authorized fishing periods. This so called "arms race" resulted in a decrease of allowable fishing time from 96 hours per week at one point in 1978 to six, six hour trips per quarter in 1989.

The complexion of the industry changed radically over the eleven years during which the moratorium has been in place. Certain factions of the industry approached the Council to determine if some relief might be effected. Many believed that some form of allocation system would solve many of the problems of the heavy overcapitalization in the industry represented by vessels having to be maintained in a state of readiness to take advantage of the few trips that were allowed each quarter. This problem was exacerbated for vessels that lost scheduled fishing trips due to adverse weather conditions.

There was an additional dilemma facing the Council in the development of the New England surf clam fishery and the ocean quahog fisheries. These are both open access fisheries. However, the New England fishery had been developed by Mid-Atlantic vessels. The quahog fishery is also dominated by vessels permitted to fish for surf clams in the Mid-Atlantic Area. There are only a handful of vessels permitted for and fishing in the New England surf clam fishery or the ocean quahog fishery.

The problem squarely before the Council was how to divide the annual quota among the participants in the fishery as fairly and equitably as possible. In advancing the several possible bases for allocating the quota, the Council was confronted with a number of considerations presented by the industry. They included:

1. cheating by fishing outside of the authorized time periods, in closed area, or double trips;
2. quota windfalls that would be garnered by owners of inactive vessels;
3. long period of investment and participation in the fishery;
4. inactivity in the fishery due to causes beyond the vessel owner's control (for example, breakdown, limited access to markets);
5. recent participation and investment in the fishery through purchase of a vessel with a moratorium permit;
6. improvements in a vessel catch performance;
7. catch histories generated through the skill of individuals not the capabilities of vessels; and
8. differing circumstances of the new England surf clam fishery and the ocean quahog fishery.

Section 303(b)(6) presents certain factors which the Council must take into account, but not necessarily provide for, in limiting access to the surf clam and ocean quahog fishery. Obviously, the Council cannot provide for all the considerations raised by the industry, some of which are cited above. The Council has exercised its discretion to focus more heavily on past catch history as substantiated by mandatory logbook reports submitted by vessel owners and dealers. This has been the central feature of the fishery since its inception. Catch is a barometer, in the Council's opinion, of present participation in the fishery, historical fishing practices, and dependence on a fishery. A vessel's catch is the most important characteristic of its operation. It determines a vessel owner's ability to survive and thrive within the fishery. It is not directly related to the size of the vessel, since many smaller vessels have outperformed larger vessels. The size of a vessel, as a major factor in an allocation formula, would result in huge inequities in the fishery. It would create great windfalls for owners of large vessels that have either lain dormant or have been relatively inactive in the fishery for years. It would penalize those small vessel owners who have outperformed their larger competitors. In short, the Council concluded that an allocation formula based largely on a vessel's size does violence to the fairness and equity considerations mandated by National Standard 4, and ignores many of the factors required to be considered by section 303(b)(6). Given the tight constraint on the Mid-Atlantic surf clam fishery the Council recognizes that catch must be tempered to take into account other factors. Some of these factors such as breakdowns and loss of market could adversely affect the vessel's catch history due to severe limitations on allowable fishing time. Thus, the Council concludes that an individual's dependence on this fishery may not be totally reflected by catch performance, though the vessel has to be maintained. Even if the vessel is not maintained, there was an initial investment to enter the fishery. Believing that factoring vessel size heavily into an allocation formula for this fishery may represent a windfall for a handful of vessel owners, the Council determined that consideration of vessel size should be used as a proxy for investment in the fishery, but only to a very limited extent for the reasons stated above. Consequently, a vessel owner's allocation will be based 80% on the vessel's catch history and 20% on the vessel's size.

The Council concluded that a vessel's catch performance should be considered from 1979 through 1988. This is a recognition of the investment that historical participants have in the fishery. The Council cannot reasonably account for so called cheating in the fishery. Even if it tried to deal only with the individuals successfully prosecuted for violations which augment catch history, there are practical problems. NMFS maintains case histories only for five years. Also, the Council believes that it would be basically unfair to penalize just this group. First they have already paid a penalty. Second, it is reasonable to believe that there were more violations in the fishery than those detected. There have been unchallenged allegations that everyone in the industry has cheated at one time or another. Therefore, cheating is a question of degree, and certainly beyond the ability of the Council to cope with. The Council anticipates that the modification made to a vessel's catch performance for the reasons discussed below will offset any significant influence cheating may have in the allocation scheme. Equally confounding the Council's ability to deal with the cheating issue are the allegations of under reporting perpetrated to prevent closure of the fishery during certain years.

The Council has also looked at present participation in this fishery from another perspective. There are a number of new participants in the fishery who have purchased vessels permitted under the moratorium. A number of these vessels were considered to have voluntarily left the fishery and were replaced at considerable expense. Some of these new participants are crewmen who have worked themselves into a position of

vessel ownership. Some may have been able to purchase only vessels that have been relatively inactive in the fishery for one reason or another, and have turned the vessel's performance around. While the Council considers this to be an equitable consideration, it does not offset the investment that other historical participants have made in the vessels over the past eleven years that the fishery has been under regulation. Accordingly, the Council has double counted a vessel's catch for the years 1985, 1986, 1987, and 1988. While this may have a negative impact on the allocation that an historical participant may receive based solely on a straight line consideration of a vessel's catch history, the Council believes that present participation in the fishery and dependence on the fishery, both factors in the above cited section, require, at most, this double counting. Those in the industry have been aware that vessel allocations of some sort have been under consideration by the Council since 1977 when the moratorium was imposed as a temporary stopgap measure to give the Council time to consider measures for the long term management of the fishery. It is unreasonable for any industry member to believe that a vessel catch history would not figure significantly into whatever allocation scheme might be devised by the Council. Consequently, those that bought into the fishery, particularly in the last few years cannot claim surprise that a vessels catch history is now the principal factor in the allocation scheme adopted by the Council.

The economics of the fishery are varied and complex as reflected in the economic analysis presented elsewhere in this Amendment. There has been an ebb and flow in the catch histories of the vessels in the fleet as market accessibility shifts, breakdowns occur, and inclement weather conditions prevent fishing operations. The Council has been extremely mindful of these and the other economic factors affecting the industry. The adjustments to the allocation formulas reflect a consideration of the economics of the fishery. Vessel safety is of paramount concern to the Council. The Council has polled the industry a number of times with respect to changing the existing make up day provision. The industry by an overwhelming majority responded that the provision should not be revised. Notwithstanding the industry's response, the allocation system will allow vessel owners to harvest their quota whenever they so choose, without being concerned about lost fishing trips due to weather, though the present system of scheduling and rescheduling trips has gone a long way towards ameliorating this problem.

The Council is aware that there are circumstances beyond the control of vessel owners which have prevented a more robust catch history for their vessels. The two principal factors are market access and breakdowns. These are considerations which the Council feels from an equitable standpoint should be factored into the allocation formula. Consequently, the allocation formula provides that the worst two years of a vessel's catch history are not counted.

While the Council has considered a number of factors as equitable considerations in the allocation formula for this fishery, it must point out that it does not intend the allocation formula to be a guarantee that participants in the fishery will receive an allocation consistent with their vessel's best performance. It need not. See the guidelines for the national standards at 50 CFR §602.14. The Council understands that there will be negative impacts even for some of the long term participants in the fishery. The impacts on the long term participants are the result of equitable consideration which the Council in the reasonable exercise of its discretion believes should be part of the allocation scheme. The other negative impacts are those associated with a vessels owners allocation vis-a-vis the vessel's best performance in the fishery. These negative impacts are the result of attempting to achieve the objective of this Amendment to achieve economic efficiency. The Council believes that an allocation system is the best means of achieving this objective. While there are several bases for allocating the resource, each with its own set of negative impacts, the Council believes that the a formula based largely on weighted history represents the fairest means of allocation particularly among those that have shouldered the regulatory burden the longest.

The allocation system will relieve the strain placed on the industry by the present fishing time limitations, and return it partially to the cultural and social framework that exists in an open fishery. Consolidation of allocations on fewer vessels represents tremendous savings for owners of multiple vessels. The single vessel owner also benefits from the ability to harvest the allocation when weather and market conditions and access are favorable. The remainder of the year in which a vessel owner chooses not to fish for surf clams can be used to save insurance and other costs by tying the vessel up or pursuing the possibility of engaging in other fisheries. This latter possibility may be more realistic under an allocation system where the vessel does not have to be re-rigged to fish its allowable surf clam trips each quarter. Vessel owners with small allocations may employ the flexibility of the allocation system to associate with other vessel owners in a similar situation. Possibly, one vessel could be used to harvest several small allocations The allocation also translates the value of the moratorium permit into a more marketable form. Someone interested in getting out of this fishery would not now have to find a buyer for his/her vessel. The allocation could simply be sold. All of these possibilities

offset, at least in part, any diminution from a vessel's best performance represented by the allocation. These economies represent yearly saving of amounts of capital that would have to be spent to maintain vessels fishing under the present management scheme.

The New England surf clam fishery and the ocean quahog fisheries dictate a much different approach to allocation than the Mid-Atlantic surf clam fishery. This obtains from the fact that both are open access fisheries. Vessels are free to participate in these fisheries largely unconstrained by measures other than quotas with a limited exception represented by the imposition of trip limits in the Nantucket Shoals Area late in 1989. Consequently, the equitable considerations before the Council relative to allocating the quota among those permitted in these fisheries are different. A vessel's catch is the best indicator of participation and dependence on these open fisheries. Individuals participated to the level they were able to secure markets for their catch. thus, catch is equally reflexive of the economics of these fisheries. Given the largely unconstrained nature of the overall quotas for these fisheries, the Council believes that an allocation of these quotas on the basis of the average catch for the years fished is the fairest and most equitable basis. If someone just entered the fishery, they would not be penalized. To do so would be unfair given the fact that these fisheries offer open entry. Also, by discounting an individual's worst year would ameliorate the affects of breakdowns or lost markets experienced by longer participants in these fisheries. This reflects the fact that the effects of these factors on catches in these fisheries are not as severe as in the Mid-Atlantic surf clam fishery. The conscious decision by the Council not to use the dimensions of the vessel as a proxy for investment is due to the fact that vessels in these fisheries could be replaced at will, whereas vessels in the Mid-Atlantic surf clam fishery could be replaced only if they involuntarily left the fishery, and only then with one of similar harvesting capacity.

The Council, in limiting access to these fisheries, has taken into account the associated economics by adopting a comprehensive allocation scheme. It had tailored the allocation formulas to meet the differing circumstances of these fisheries and ensured that no aspect of these fisheries could be negatively impacted by a sudden shift in vessels freed by another allocation scheme or by allowing market access to be manipulated. It has also allowed individuals to leave these fisheries and realize a return on their investment., The allocation scheme allows vessels not needed to harvest allocation to be sold or to pursue other fisheries to the extent they are able. In sum, the Council had been very mindful of the factors this section of the Magnuson Act directs that it consider, and had attempted to strike a reasonable balance among the many conflicting concerns of the industry.

9.2.3. Cost/Benefit Analysis (Note: the analyses of the alternative management systems considered are presented in Appendix 1 and the analyses of the alternative allocation formulas are presented in Appendix 2.)

9.2.3.1. Analysis of fleet net revenues on a per vessel basis

In section 8, net revenues from current vessel operations were evaluated on the basis of the entire fleet. However, in order to obtain an appreciation for how the FMP will affect the economics of individual vessels, it is instructive to take the relationships developed there and distill from them the following average estimates:

	Class 1	Class 2	Class 3
AVERAGE ANNUAL FIXED COSTS	$54,400	$85,300	$147,400
SURF CLAMS TRIPS			
Revenue per trip	$ 3,400	$ 6,500	$ 10,200
Less variable cost per trip	1,800	3,100	4,900
Net revenue per trip	$ 1,600	$ 3,400	$ 5,300
Number of trips to break even	34	25	28
OCEAN QUAHOG TRIPS			
Revenue per trip	-	$ 3,100	$ 4,200
Less variable cost per trip	-	2,400	3,600
Net revenue per trip	-	$ 700	$ 600
Number of trips to break even	-	122	246

The revenue figures are based on an average price of $8.01 per bushel for surf clams and $2.89 per bushel for ocean quahogs (USDC, 1988b). Average catch figures for surf clam trips equaled 428 bushels per trip for Class 1 vessels, 808 bushels per trip for Class 2 vessels, and 1,274 bushels per trip for Class 3 vessels (1987 logbook data). For ocean quahog trips, Class 2 vessels averaged 1,078 bushels per trip and Class 3 vessels averaged 1,456 bushels per trip (Class 1 vessels have not participated in the ocean quahog fishery).

The average Class 1 vessel has approximately $54,400 in fixed costs each year which must be covered before it can start earning money. (The crew, however, starts to make money from the first trip.) When making EEZ surf clam trips, this generalized vessel grosses $3,400 per trip. After paying variable expenses of $1,800 for food, fuel, and supplies, net revenue per trip amounts to $1,600. With net revenues of $1,600 per trip, the vessel must make 34 trips in order to break even and cover the fixed costs of $54,400. For the average Class 2 vessel, this break even point comes at 25 trips, and at 28 trips for Class 3.

With the current number of allowed EEZ trips being approximately 24, it is clear why the lower valued fisheries for quahogs and New Jersey inshore clams are of critical importance to most clammers. If the average fisherman is only allowed enough EEZ clam trips to cover his fixed costs, most of his annual profit will come from these other sources.

From the number of quahog trips which it would require to break even without a supplementary source of income (122 for Class 2 vessels, 246 for Class 3), it comes as no surprise that in 1987 only 3 vessels attempted it. Doubtless the owners of these vessels expected harvests far greater than the averages for their classes.

9.2.3.2. Prospective net benefits from a reduction in fleet numbers

Under the current system, the number of active vessels in the fleet has a direct impact on the number of trips which the aggregate will be allowed to take. More vessels translates into more fishing power, and the higher the fishing power of the fleet, the fewer the number of "fleet trips" that will be required to take the annual quota.

In 1987, there were 145 active vessels in New England and the Mid-Atlantic: 11 in Class 1, 55 in Class 2, and 79 in Class 3. In order to estimate the minimum potential benefits which could be derived from several alternatives which encourage reduction in fleet numbers, a number of conservative assumptions were made:

1. Average prices for surf clams and ocean quahogs remain at 1987 levels, the lowest they have been since 1983.
2. Once the fleet has stabilized over a period of years, the number of active vessels will have at least halved.
3. Vessels which are retired will be the older, less safe, and less efficient members of the fleet. When combined with any increased flexibility in operations allowed by this Amendment, the remaining vessels should be able to increase their net revenue per trip over the status quo. A conservative assumption, then, would be to assume they maintain current average landings per trip as well as current net revenues per trip.
4. Given the current quota for surf clams of 3,150,000 bushels per year, after the fleet size decreased, each vessel could take a total of 41 trips before the quota is reached. This assumes 6 Class 1 vessels are catching their average 428 bushels per trip, 28 Class 2 vessels are catching 808 bushels per trip, and 40 Class 3 vessels are catching 1,274 bushels per trip. For ocean quahogs, a total of 62 trips could be taken by Class 2 and Class 3 vessels before landings reached the 5.5 million bushel level, a figure which could easily be attained in the near future if recent landing trends continue. Recall that no Class 1 vessels have yet participated in the ocean quahog fishery.

Given these assumptions, fleet profitability is estimated as follows:

	Class 1	Class 2	Class 3
Number of vessels	6	a28	40
Gross revenues	$ 843,000	$ 12,838,000	$ 27,171,000
Less total costs	769,000	10,114,000	22,860,000
Net revenues	$ 74,000	$ 2,724,000	$ 4,311,000

Summing across classes, projected fleet net revenues would exceed $7 million, compared to the current estimate which is a loss of over $3 million. It is important to remember that this increase is a conservative estimate. If the assumption is relaxed to allow for a 2/3 reduction in fleet size (thereby lowering total fixed costs), fleet net revenues are estimated at almost $10 million, an increase of $13 million.

9.2.4. Evaluation of Formulas for Initial Annual Allocation of Surf Clams Coastwide

The allocation formulas adopted by the Council were evaluated relative to two comparative base lines: long term (1979-88) share of landings and recent (1985-88) share of landings. The rationale for these two evaluations stems from the nature of the fishery under the Mid-Atlantic Area moratorium.

The original Surf Clam and Ocean Quahog FMP (MAFMC, 1977) established a moratorium on new entrants to the surf clam fishery. Amendment 2 divided the management unit into the Mid-Atlantic and New England Areas, with no moratorium in New England. The ocean quahog fishery has always remained open to new entrants. The moratorium was intended by the Council to be a transitional step to some form of allocation system. Unfortunately, a feasible allocation scheme could not be developed in such a short time frame and the fishery has operated under the moratorium continuously to the present.

Use of logbook records for the determination of historical shares of the catch has been complicated by the fact that ownership transfer of moratorium vessels, including the associated permit, has been allowed under the FMP (section 7.5.2). Many individual participants have changed over time and moratorium permits have thus acquired a capitalized value which is reflected in the sale price of vessels. Recent purchasers of vessels will resist any allocation scheme which restricts their ability to recover capital outlays. Additionally, some participants feel that catch records have been unduly influenced by market concentration in the processing sector or are not representative because they were unable to fish due to equipment problems. These participants contend that use of catch records will perpetuate an inequitable distribution of the resource. In response to such concerns, the cubic measure of the vessel has been put forth as a basis for allocation which, presumably, is related to harvesting capacity and therefore is a measure of dependence on the fishery.

In order to assess the differential impacts of the allocation formulas on both long term participants and more recent entrants, the two historical base lines were chosen. Each of the base lines has its merits and embodies contentious issues, making it difficult to determine whether either is more fair and equitable. Nonetheless, the relative (percent) change in quota share from the shares actually taken by each vessel over the two periods (1979-88 and 1985-88) are evaluated for each allocation formula. The concept was to specify an analytical measure of the inherent trade offs in the limited entry section of the MFCMA which requires that the Council consider historical participation in the fishery as well as current dependence on the fishery.

It should be noted that a percentage loss in catch share or bushel allocation is not necessarily an economic loss for an individual vessel when viewed in the context of the entire allocation program. Those with a loss in surf clam share may gain in ocean quahogs. Additionally, cost savings from consolidation and transfer of catch to more efficient vessels may more than compensate for any loss in catch share (for example, given the estimated $147,400 average class 3 fixed cost and the 1987 price of $8.01/bushel for surf clams, consolidation of two class 3 vessels on one saves the equivalent of 18,402 bushels of clams). In all likelihood, the fleet as a whole will show gains in net income (section 9.2.3.1.2.), though it is possible that some individual vessels will be negatively impacted by the direct allocation of shares.

It should also be noted that, since allocations are on a percentage basis, actual annual bushel allocations will vary over time as the annual quota is adjusted. These future distributive effects, whether positive or negative, are not directly attributable to the allocation program and must not be viewed as such.

Catch share in the future should reflect the effort expended by the individual fisherman in the past while each has had an equal opportunity to participate. It should be noted that the trip limits originally recommended by the Regional Director for the initial Surf Clam and Ocean quahog FMP were rejected on grounds that they resulted in too great a redistribution of historical catch share and could not be justified based on the limited data on vessel class performance available at the time. Since then, a more complete and accurate picture of participation has become available through the logbook system and the staff believes these data should serve as the primary basis for allocation.

The distributive effects of the surf clam allocation formula, based on distribution of the existing quota levels, are almost entirely positive when compared to long term average catch. The maximum deviation is an increase of 25,660% and the minimum is a loss of 11%, with a median of 27%.

When compared to the short term baseline, the maximum deviation is an increase of 300% and the minimum is a loss of 30%, with a median of 3%, indicating that this allocation formula redistributes a small portion of the shares of few long term strong performers to a few participants whose recent catches were better than in the past and are currently fishing closer to vessel capacity. Since most surf clam vessels cannot readily shift into other fisheries, it was felt that additional emphasis on current investment was warranted. The Council believes these adjustments made to long term history were necessary to more accurately reflect present participation and dependence. This is why 1988 was added to the base and counted twice and why the cost factor share was increased from 10 to 20%.

Analyzing the impacts in terms of the percentage difference in bushels allocated versus bushels caught has two short comings. The first is that the percentage changes on the extremes often represent vessels with very

small catches, so that even a small change as a result of the allocation formula results in a significant *percentage* gain or loss relative to historical catch in bushels. The other problem is that doing the analysis in bushels biases the outcome because of the effect of quota increases.

If the comparison is done in terms of the share of the quota allocated per vessel versus the share of the total catch the vessel caught over time, the quota increase basis is eliminated as is the bias of large percentage changes for small absolute catches. The adopted formula, compared to 1979-1988 reported catch, shows a minimum of -0.003272, a median of -0.000012, and a maximum of 0.013206. Expressed as a percentage of the total quota, the most disadvantaged boat would lose 0.3272% of the quota (not a 0.3272% loss, but a loss of 0.3272% of the quota), the median vessel (ranking the boats from the boat with the greatest loss to the boat with the largest gain) would lose 0.0012%, and the largest gainer would increase 1.3206%.

If the share analysis is made relative to the actual shares for 1985-1988, the adopted formula, compared to 1979-1988 reported catch, shows a minimum of -0.006230, a median of -0.000104, and a maximum of 0.011140.

The reader may judge that carrying the analysis to six decimal places may be excessive, but it must be recalled that one cage of clams (32 bushels) equals 0.000010 share.

The ocean quahog formula was developed because the quahog fishery would operate under a controlled system for the first time. All participants have not been on an equal footing over the ten year history since entry or re-entry has been legal at any time. For example, utilizing a ten year average for a first time participant in 1988 would unfairly bias catch records downward. Some vessels that were active in the fishery early in the time period are no longer significant participants, while new vessels now make a significant contribution to the catch. Again, this required an examination of the balance between historical participation and current dependence. In the final FMP this was addressed by adding 1988 to the historical base and by deducting the vessel's worst non-zero year. This reflected the Council's assessment of the public hearing and comment process that, while long term history should not be discounted, the formulas should reflect the current situation more that did the formulas in the hearing draft (Appendix 2). Relative to 1979-1988 performance, the greatest loss, in terms of share of the total quota, was 0.019839, the median vessel gained 0.000430, the the largest gain was 0.018350. Relative to 1985-1988, the largest loss was 0.014624, the median vessel gained 0.000249, and largest gain was 0.022191.

9.2.5. Analysis of Non-Quantifiable Aspects of the Preferred Alternative

9.2.5.1. General benefits of an allocation system

There are a number of important advantages which fishermen derive from an allocation management system, many of which will translate into higher financial returns, and others which provide for greater freedom of action and safety of operation.

Transferable allocation systems in general provide for greatly increased economic efficiency in a fishery over open access. With secure harvesting access provided for by government, fishermen are no longer forced to compete with one another for the largest share of a fishery resource. They are encouraged to harvest the resource in a manner which is least costly to them, and thereby earn the most profit for themselves as well as the industry as a whole.

Effort limitation provisions are no longer necessary with an allocation system, so the vessel moratorium, quarterly quotas, constrained fishing hours, and bad weather makeup days would all be discontinued. With no penalties involved for canceling a trip due to bad weather, safety concerns for the fleet are finally fully addressed. The ability to transfer allocations to other vessels removes impediments to modernizing the fleet and retiring deteriorating, unsafe vessels. Time and trip limits no longer encourage fishermen to overload their vessels, or waste fuel in rushing to and from the fishing grounds. Given the time to explore and be selective in the beds that they fish, vessels should be able to harvest larger and more valuable clams.

The principal negative effects of the proposed allocation system are two: the fact that initial entry will no longer be completely free for the ocean quahog and New England Area surf clam fisheries, and the potential disruption which a rapid change in management may have on the industry. In response to the first point, the ability to enter a fishery without cost must be weighed against the benefits of the alternative. The preceding sections present a clear case as to why net benefits can be expected to increase substantially from such a policy for current participants. Costs will be higher for new entrants without initial allocations. However, this situation is no different from the vast majority of other industries in the US and world economy, especially those which use natural resources.

9.2.5.2. Combining the Mid-Atlantic and New England Areas

The FMP would combine the Mid-Atlantic and New England regions into a single management unit for both surf clams and ocean quahogs. In so doing, the Council recognizes the interrelated nature of the fisheries for both species, and allows for consistent management throughout their range, as required by national standard 3.

The rationale for creation of the Nantucket and Georges Bank areas was centered on the argument that they were underdeveloped fisheries, and hence should not be managed under the same restrictive management scheme as the Mid-Atlantic. It can be argued, however, that the fishery was fully developed as of 1 April 1983, the day that effort limitations first went in to effect. Additionally, while the New England region has officially existed for six years, in 1987 only nine New England vessels chose to participate in the fishery.

Controversy over combination of the two areas would more accurately be described as a distributional issue, with New England fishermen concerned about future limitations on their fishing options. The ten New England vessels which have recorded logbook landings for surf clams would all be included under the FMP, and be accorded initial allocations equal to the average of their years fished.

9.2.5.3. Inclusion of ocean quahogs under allocation management

The inclusion of ocean quahogs in an allocation program at this time would avoid the problems of time management which the Council and industry has experienced with surf clams. The trend in landings for ocean quahogs has increased over time, particularly since 1984 when effort limitations on surf clams became more restrictive. It is possible that the maximum quota of six million bushels for ocean quahogs could be taken within the next few years. Clearly, it is preferable to design and implement the appropriate long term management strategy ***before*** this segment of the fishery becomes overcapitalized, and effort limitations become necessary which will reduce their efficiency and profitability.

Increasing shares of the quota can be harvested by vessels owned or closely associated with processors, leaving independent vessels with decreasing opportunities to participate in the fishery. This has been most evident since 1987, when the Regional Director began setting the number of quarterly trips allowed per vessel, rather than the allowable fishing hours. It has been claimed by industry participants (comments at council meetings) that vertically integrated processors are not contracting with independent vessels so that the quarterly quota is not reached, thus enabling processors to use their own vessels when additional trips are authorized to make up the shortfall in landings.

An additional concern for the ocean quahog fishery involves potential industry reactions to the postponement of allocation management. Industry is currently well aware that the Council is looking closely at vessel catch histories in meeting the requirements of the Magnuson Act to take into account "historical fishing practices in, and dependence on, the fishery" when designing allocation management systems. In order to eventually obtain a larger initial allocation, vessels have already started taking more quahog trips to build up their catch histories, which at the same time has the effect of accelerating the progression to a point where an allocation system is needed. Integrated firms which have better access to quahog markets will have a competitive advantage during this buildup, and can be expected to buy preferentially from their own boats, thereby increasing the number of trips they could take. Independent harvesters, therefore, would be disadvantaged both in the short term (by not being able to sell the quahogs they catch today) and in the long term (by getting smaller allocations as a result).

In summary, there are risks associated with postponing allocation management for ocean quahogs which should be seriously considered before a management decision is made.

9.2.5.4. Suspension of minimum size limit

The surf clam minimum size limit has had positive and negative impacts in its initial form and as it has been changed. The intent of the proposed revisions is to restructure the management measure to provide a biological safeguard for the resource.

The initial surf clam minimum size limit (5.5") was intended to allow the clams to not only attain spawning size (2") and maximum yield per recruit size (4.75"), but also the minimum size for making strips for fried clams. At the time the top valued product was clam strips (as opposed to minced clams, chowder, juice, etc.) and the concern was that the very limited (at that time) quota not be taken in small clams, thereby decreasing the overall value of the fishery.

The stock began to recover over time and the market shifted toward chowder (reducing the demand for larger clams). In large part there was an adequate supply of clams larger than 4.75", but not 5.5". Fishermen could catch clams larger than maximum yield per recruit size, for which they had a market, but they could not land them without violating the regulations. This led to discarding gross quantities of clams, the vast majority of which died (Haskin *et al.*, 1986). Also, many violations of the size limit regulation occurred. As a consequence, the size limit was restructured to allow the limit to be adjusted between 4.75" and 5.5" to keep the average discards rate below 30%.

Given the current mix of year classes in the resource, the vast majority of the stock is larger than 4.75". Hence, the regulation has no real benefit. However, repeal would be unwise since future recruitment may make the minimum size limit a useful tool once again. Therefore, the FMP reduces the minimum size to 4.75" (equal to maximum yield per recruit), and allows for it to be suspended on a year to year basis when stock conditions warrant.

The net effect is that the biological protection is still readily available when needed but costs are not incurred by industry and government when it is not needed.

9.2.5.5. Administrative costs and benefits

The issuance of annual vessel permits for surf clam and ocean quahog vessels will not change under this Amendment. However, cost savings should occur over time due to the provisions for vessel consolidation reducing the number or permits which must be processed.

The new costs which arise from this Amendment are those associated with the issuance of allocation permits, and in keeping track of their subsequent sale and resale by the industry. These costs should decrease rapidly as allocations are combined and older vessels are retired from the fishery. Given the smaller size of the quahog fleet, it is likely that an initial flurry of trading will be followed by steady participation of a relatively small number of vessels.

The replacement of the times based management system with the allocation system will significantly reduce administrative costs through elimination of the need to assign and monitor individual vessel fishing days, the bad weather make up day provision, and related measures.

Finally, costs which will be mitigated are those associated with the existing vessel replacement program. The administrative process which must certify that a vessel is retiring involuntarily from the fishery and is being replaced by one of similar harvesting capacity will no longer be necessary.

9.2.5.6. Reporting costs

Overall reporting costs are expected to decrease from those currently experienced by the industry. Requirements for choosing fishing days, scheduling make up days, and notifying changes in fishing areas will all cease with implementation of this Amendment. Since the logbook provisions remain unchanged, the principal increase is in the reporting of cage tag and allocation transfers. For individual fishermen, these are expected to be infrequent events, which would be more than outweighed by a reduction in scheduling and area notification requirements. The addition of a requirement to call NMFS before the vessel lands is considered of minor impact since it corresponds to a time when most vessels will be contacting their buyers with the same information, and NMFS has an 800 number for their use.

9.2.5.7. Enforcement costs

The joint NMFS/Coast Guard enforcement document (USDC, 1985) develops a methodology for estimating enforcement costs for regulated commercial fisheries. Basically, the total number of annual contacts required to achieve the desired compliance are estimated given the vessel population, geographic factors and factors unique to the particular management measures. Contacts are divided between those required at sea and those which can be performed dockside. In 1985, there were nine management measures requiring enforcement for the surf clam/ocean quahog fishery: eight dockside and one at sea. Costs for enforcing those measures were calculated at 4.5 man-years, 42 cutter days and 104 low intensity aircraft hours using the specified methodology.

Enforcement of the proposed management measures for this amendment are intended to be predominately dockside with monitoring of the cage tag requirements performed at processing plants. The allocation system eliminates the need to enforce the time restrictions at sea, and also eliminates the weather make up day and the need to enforce the vessel moratorium. Additionally, suspension of the size limit will reduce enforcement requirements dockside.

Based on the joint NMFS/Coast Guard enforcement document, total annual contacts per vessel should decrease from 10 to 4, one each for reducing regulatory complexity and industry pressure, 2 for eliminating the restriction on trips per year, and an additional 2 for reducing the vessel population (section 9.2.3.1.2). Assuming 74 active vessels affected by the regulations, approximately 300 contacts would be necessary per year (each vessel contacted 4 times per year at one of the approximately 15 processing plants). No at sea contacts would be necessary. Additionally, no aircraft surveillance will be necessary since there will be no closed areas for the protection of undersized clams in the foreseeable future because of the year classes in the resource. The total resources required will be 1.0 man year, 0 cutter days and 0 aircraft hours. This amounts to a saving of approximately 3.5 man-years ($50,000/year) or $175,000, 42 cutter days ($6828/day) or $287,000, and 104 aircraft hours ($2,301/hour) or $240,000. The total savings attributable to the proposed management measures are therefore estimated to be $702,000.

These savings must be viewed as a minimum estimate since the vessel population may decrease even more as older, excess vessels are retired and allocations are consolidated. This will reduce the number of contacts even further than estimated here. In addition, although the enforcement resources to be released from existing assignments are stipulated above, the actual benefits to society may be even greater. The benefits to the Coast Guard of such transfers would be the cost savings of the current assignment.

9.2.5.8. Prices to consumers

Retail prices to consumers are expected to remain stable under this Amendment. Cost savings are expected to occur principally in fleet operations, through reduction of fixed costs. Given that the fleet as a whole is currently operating at a loss, it is likely that these savings will be used to improve profit margins rather than be passed along to retail consumers.

9.2.5.9. Redistribution of costs

The FMP is designed to give fishermen the greatest possible freedom of action in conducting business consistent with the FMP's objectives. It is not anticipated that the proposed management measures will redistribute costs between users or from one level of government to another.

9.3. RELATION OF RECOMMENDED MEASURES TO EXISTING APPLICABLE LAWS AND POLICIES

9.3.1. FMPs

Many fisheries of the northwest Atlantic result in significant non-target species fishing mortality. Therefore, each FMP must consider the impact of non-target species fishing mortality on other stocks and as a result of other fisheries. There is no significant bycatch of other species in either the surf clam or ocean quahog fisheries.

9.3.2. Treaties or international agreements

No treaties or international agreements, other than GIFAs entered into pursuant to the MFCMA, relate to this fishery.

9.3.3. Federal law and policies

9.3.3.1. Marine Mammals and Endangered Species

Numerous species of marine mammals and sea turtles occur in the northwest Atlantic Ocean. The most recent comprehensive survey in this region was done from 1979-1982 by the Cetacean and Turtle Assessment Program (CETAP), at the University of Rhode Island (University of Rhode Island, 1982), under contract to the Minerals Management Service (MMS), Department of the Interior. The following is a summary of some of the information gathered in that study, which covered the area from Cape Sable, Nova Scotia, to Cape Hatteras, North Carolina, from the coastline to 5 nautical miles seaward of the 1000 fathom isobath.

Four hundred and seventy one large whale sightings, 1547 small whale sightings and 1172 sea turtles were encountered in the surveys (Table 47). The "estimated minimum population number" for each mammal and turtle, as well as those species the area currently included under the Endangered Species Act were also tabulated.

CETAP concluded that both large and small cetaceans are widely distributed throughout the study area in all four seasons, and grouped the 13 most commonly seen species into three categories, based on geographical distribution. The first group contains only the harbor porpoise, which is distributed only over the shelf and throughout the Gulf of Maine, Cape Cod, and Georges Bank, but probably not southwest of Nantucket. The

second group contains the most frequently encountered baleen whales (fin, humpback, minke, and right whales) and the white-sided dolphin. These are found in the same areas as the harbor porpoise, and also occasionally over the shelf at least to Cape Hatteras or out to the shelf edge. The third group "shows a strong tendency for association with the shelf edge" and includes the grampus, striped, spotted, saddleback, and bottlenose dolphins, and the sperm and pilot whales.

Loggerhead turtles were found throughout the study area, but appear to migrate north to about Massachusetts in summer and south in winter. Leatherbacks appear to have a more northerly distribution. CETAP hypothesized a northward migration in the Gulf Stream with a southward return in continental shelf waters nearer to shore. Both species usually were found over the shoreward half of the slope and in depths less than 200 feet. The study area may be important for sea turtle feeding or migrations, but the nesting areas for these species generally are in the South Atlantic and Gulf of Mexico.

Studies of sea turtles in Chesapeake Bay (Musick *et al.*, 1983) found that loggerhead and some ridley turtles spend the summer in Chesapeake Bay. Mortalities of sea turtles were studied, with pound net related causes accounting for about 19%, all other identifiable causes accounting for 11%; with the cause of death undetermined for the remaining 70%. The capture of turtles in pound nets apparently depends on the position of the net and the type of net.

The only other endangered species occurring in the northwest Atlantic is the shortnose sturgeon (*Acipenser brevirostrum*). The Councils urge fishermen to report any incidental catches of this species to the Regional Director, NMFS, One Blackburn Drive, Gloucester, MA 01930, who can forward the information to the active sturgeon data base.

The range of surf clams and ocean quahogs and the above marine mammals and endangered species overlap to a large degree, and there always exists some very limited potential for an incidental kill. Except in unique situations (e.g., tuna-porpoise in the central Pacific), such accidental catches should have a negligible impact on marine mammal/endangered species abundances, and the Council does not believe that implementation of this Amendment will have any adverse impact upon these populations. While marine mammals and endangered species may occur near surf clam and ocean quahog beds, it is highly unlikely any significant conflict between the fishermen managed by this Amendment and these species would occur. Clam vessels dredge at very slow speeds and healthy animals should have no difficulty avoiding these vessels. Additionally, surf clams and ocean quahogs are benthic organisms, while marine mammals and marine turtles are pelagic and spend nearly all of their time up in the water column or near the surface. The anticipated reduction in the number of fishing vessels resulting from this Amendment should reduce the potential for the capture of endangered species from a trivial to a very trivial level.

9.3.3.2. Marine sanctuaries

There is one national marine sanctuary in the area covered by the FMP: the USS *Monitor* National Marine Sanctuary off North Carolina. The Sanctuary was officially established on 30 January 1975 under the Marine Protection, Research, and Sanctuaries Act of 1972. Rules and regulations have been issued (15 CFR 924) that prohibit deploying any equipment in the Sanctuary, fishing activities which involve "anchoring in any manner, stopping, remaining, or drifting without power at any time" (924.3 (a)), and "trawling" (924.3(h)). The Sanctuary is clearly designated on all National Ocean Survey charts by the caption "protected area". This minimizes the potential for damage to the Sanctuary by fishing operations. Details on sanctuary regulations may be obtained from the Director, Sanctuary Programs Office, Office of Coastal Zone Management, NOAA, 3300 Whitehaven Street NW, Washington, DC 20235.

9.3.3.3. Indian treaty fishing rights

No Indian treaty fishing rights are known to exist in the fishery.

9.3.3.4. Oil, gas, mineral, and deep water port development

Although Outer Continental Shelf (OCS) development plans may involve areas overlapping those contemplated for offshore fishery management, no major conflicts have been identified to date. The Council, through involvement in the Intergovernmental Planning Program of the MMS monitors OCS activities and has opportunity to comment and to advise MMS of the Council's activities. Certainly, the potential for conflict exists if communication between interests is not maintained or appreciation of each other's efforts is lacking. Potential conflicts include, from a fishery management position: exclusion areas, adverse impacts to sensitive biologically important areas, oil contamination, substrate hazards to fishing gear, and competition for crews and harbor space. The Council is unaware of pending deep water port plans which would directly

impact offshore fishery management goals in the areas under consideration, and is unaware of potential effects of offshore fishery management plans upon future development of deep water port facilities.

9.3.3.5. Impacts of the Amendment relative to the Paperwork Reduction Act and the Regulatory Flexibility Act

The Paperwork Reduction Act concerns the collection of information. The intent of the Act is to minimize the Federal paperwork burden for individuals, small businesses, and State and local governments, as well as to maximize the usefulness of information that is collected by the Federal government.

Current paperwork requirements under the FMP include the vessel permit application, notification of fishing days, notification of intent to fish in certain zones (when applicable), recording of fishing activity in official logbooks, and reporting of processing and employment data by dealers receiving surf clams and ocean quahogs. All reporting requirements other than notification will remained unchanged. The notification requirements, both for fishing days and fishing zones, will be eliminated under this Amendment since all surf clam fishing areas will be combined and effort restrictions will be dropped. New notification requirements concerning the transfer of allocation and/or cage tags will be implemented, however. The net effect shall be no change in the paperwork burden from that under the existing regulations, thus the Amendment is consistent with the PRA.

The Regulatory Flexibility Act requires the examination of the impacts of Federal regulations on small businesses, small organizations, and small jurisdictions. Many business enterprises which harvest or process surf clams and ocean quahogs are considered small under the interpretation of this Act.

It is the intention of the Council that the changes in regulatory requirements under Amendment 8 will reduce the burden on small businesses and increase the degree of flexibility operators have in managing their businesses. The combination of all surf clam fishing areas and the elimination of effort restrictions will enable vessel operators to decide for themselves when and where to fish. The loss of fishing time due to inclement weather will be reduced since trips may be rescheduled without notification and approval by NMFS. Concerns about vessel safety and harvesting efficiency can be addressed since the Mid-Atlantic Area moratorium will be lifted and vessel replacement will no longer be subject to interpretive rules on fishing power. Guaranteed ownership of harvest share will facilitate business decisions on the allocation of effort among vessels and in inventory planning by processors. Overall, compliance with the RFA will be greatly improved with the implementation of this Amendment.

9.3.4. State, Local, and Other Applicable Law and Policies

9.3.4.1. State management activities

Current State surf clam minimum size limits are: Massachusetts, 5"; Rhode Island, 5.5"; New York, 4"; New Jersey, none; Maryland, 5.5"; and Virginia, 5.5".

9.3.4.2. State action necessary to implement measures within State waters to achieve FMP objectives, consequences of State inaction or contrary action, and recommendations

The FMP provides that all surf clams and ocean quahogs landed in cages that do not have tags issued by a State government are deemed to have been caught in the EEZ, must have a Federal cage tag, and are subject to the Federal surf clam minimum size limit. The New Jersey surf clam management program is coordinated with the Federal program. However, other States may need to institute an identification program for surf clams and ocean quahogs caught in State waters,

9.3.4.3. Impact of Federal regulations on State management activities

To the extent that a State would need to institute a cage identification program for surf clams and ocean quahogs caught in State waters, there might be a cost impact on the State.

9.3.4.4. Coastal zone management program consistency

The CZM Act of 1972, as amended, provides measures for ensuring stability of productive fishery habitat while striving to balance development pressures with social, economic, cultural, and other impacts on the coastal zone. It is recognized that responsible management of both coastal zones and fish stocks must involve mutually supportive goals.

The Council must determine whether the Amendment will affect a State's coastal zone. If it will, the Amendment must be evaluated relative to the State's approved CZM program to determine whether it is consistent to the maximum extent practicable. The States have 45 days in which to agree or disagree with the Council's

evaluation. If a State fails to respond within 45 days, the State's agreement may be presumed. If a State disagrees, the issue may be resolved through negotiation or, if that fails, by the Secretary.

In order to comply with the CZM Act, Amendment #8 was reviewed relative to the approved CZM programs of Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, and Maryland. Letters have been sent to all of the States listed above stating that the Council concluded that the Amendment is consistent to the maximum extent practicable with the State's CZM program as understood by the Council.

9.4. COUNCIL REVIEW AND MONITORING OF THE FMP

The Councils will monitor the fishery using the best available data, including that specified in section 9.1.2.8. As a result of that monitoring, the Councils will determine whether it is necessary to amend the FMP.

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Table 1. Surf Clam Landings (millions of lbs of meat) and Distribution by State, 1950-1987

	New England		NY		NJ		DE		MD		VA		Total#		
	Land	%	Land	%	Land	%	Land	%	Land	%	Land	%	Land	%	% Change
1950	*	1	3	42	4	55	-	-	*	2	-	-	8	100	
1951	*	*	4	34	6	53	-	-	2	13	-	-	12	100	50%
1952	*	*	4	33	7	59	-	-	1	9	-	-	13	100	8
1953	-	-	3	27	7	53	-	-	2	20	-	-	12	100	-8
1954	*	3	3	28	7	58	-	-	1	11	-	-	12	100	*
1955	*	*	2	17	8	69	-	-	2	14	-	-	12	100	*
1956	*	1	2	15	12	72	*	*	2	12	-	-	16	100	33
1957	*	*	2	9	15	85	*	1	1	5	-	-	18	100	13
1958	*	*	*	3	13	85	1	5	1	5	-	-	15	100	-17
1959	*	*	1	2	20	87	2	7	1	4	-	-	23	100	53
1960	*	*	1	3	23	94	*	2	*	2	-	-	25	100	9
1961	*	*	1	3	27	97	-	-	*	*	-	-	28	100	12
1962	*	*	1	3	30	97	*	*	*	*	-	-	31	100	11
1963	-	-	1	3	38	97	-	-	*	*	-	-	39	100	26
1964	*	*	1	3	37	97	-	-	*	*	-	-	38	100	-3
1965	*	-	2	3	42	96	-	-	*	1	-	-	44	100	16
1966	*	*	2	4	43	96	-	-	*	*	-	-	45	100	2
1967	*	*	2	5	42	92	-	-	1	3	-	-	45	100	*
1968	*	*	3	7	32	79	-	-	5	13	*	*	41	100	-9
1969	*	*	3	7	36	73	3	6	7	1	*	*	50	100	22
1970	*	*	4	6	40	59	9	13	14	20	1	1	67	100	34
1971	*	1	4	7	29	55	8	15	8	15	5	9	53	100	-21
1972	*	*	3	4	21	34	9	14	7	12	23	37	64	100	21
1973	*	*	3	4	22	26	7	8	7	9	43	53	82	100	28
1974	*	*	4	4	23	24	6	6	5	6	58	61	96	100	17
1975	*	*	5	5	36	41	2	3	5	6	39	45	87	100	-9
1976	*	*	3	7	24	50	-	-	7	15	14	29	49	100	-44
1977	1	2	3	7	23	45	-	-	8	16	16	31	52	100	6
1978	1	2	2	6	15	39	-	-	8	21	13	32	40	100	-23
1979	1	4	2	4	12	35	-	-	8	22	13	35	35	100	-13
1980	1	2	2	5	10	25	-	-	11	30	14	38	38	100	9
1981	1	1	2	5	20	44	-	-	12	25	11	24	46	100	21
1982	3	6	2	5	24	49	-	-	10	19	10	21	50	100	9
1983	4	7	2	4	24	43	-	-	7	13	18	32	56	100	12
1984	8	11	3	4	39	56	-	-	7	10	13	19	70	100	25
1985	10	14	7	10	33	45	-	-	9	12	13	18	73	100	4
1986	7	9	12	15	36	46	-	-	9	11	12	15	79	100	8
1987	6	10	3	5	36	59	-	-	8	13	9	15	61	100	-23

% = % of total annual landings.
% Change = % change in total landings from previous year.
# Includes any unallocated catch.
- = zero.
* = less than 500,000 lbs or .5%.

Source: USDC, 1988b and unpub. prelim. NMFS data.

Table 2. EEZ and Total Surf Clam and Ocean Quahog Landings (millions of lbs of meat), 1967-1987

	Surf Clam					Ocean Quahog					Surf Clam + Ocean Quahog	
	EEZ			Total		EEZ			Total			
	Land	% of Total	% Change	Land	% Change	Land	% of Total	% Change	Land	% Change	Land	% Change
1967	na	na	na	45		-	-		*		45	
1968	na	na	na	41	-9	-	-	-	*	*	41	-9
1969	na	na	na	50	22	-	-	-	1	*	50	22
1970	na	na	na	67	34	-	-	-	2	200	69	38
1971	50	95	na	53	-21	-	-	-	2	*	55	-20
1972	64	87	28	64	21	-	-	-	1	-50	65	18
1973	73	88	14	82	28	-	-	-	1	*	84	29
1974	74	77	1	96	17	-	-	-	1	*	97	15
1975	44	50	-41	87	-9	-	-	-	1	*	88	-9
1976	43	86	-2	49	-44	4	73	-	6	600	55	-38
1977	43	84	*	52	6	16	86	400	18	300	70	27
1978	31	79	-28	40	-23	20	88	25	23	28	63	-10
1979	29	82	-6	35	-13	32	91	60	35	52	70	11
1980	35	92	21	38	9	31	90	-3	34	-3	72	3
1981	37	80	6	46	21	35	98	13	36	6	82	14
1982	37	74	*	50	9	34	99	-3	35	-3	85	4
1983	45	80	22	56	12	34	97	*	35	*	91	7
1984	55	79	22	70	25	36	92	6	39	11	109	20
1985	52	71	-5	73	4	52	100	44	52	33	125	15
1986	55	70	5	79	8	44	98	-15	45	-13	124	-1
1987	49	80	-11	61	-23	49	98	11	50	10	111	-10

- = zero. * = less than 500,000 lbs or .5%. na = data not available.
Source: USDC, 1988b and unpub. prelim. NMFS data.

Table 3. Surf Clam Landings (thousands of lbs of meat) by State for States with Landings by Distance from Shore (miles) and Percent of Total Surf Clam Landings Taken from the EEZ, 1982-1987

Year	Distance	MA	RI	NY	NJ	MD	VA	Total
1982	0-3	562	2,316	2,456	7,614	-	-	12,948
	3-200	-	-	-	16,783	9,630	10,359	36,772
	Total	562	2,316	2,456	24,397	9,630	10,359	49,720
	EEZ %	-	-	-	69	100	100	74
1983	0-3	786	800	1,849	7,340	-	-	10,775
	3-200	250	2,163	559	17,034	6,868	18,289	45,163
	Total	1,036	2,963	2,408	24,374	6,868	18,289	55,938
	EEZ %	24	73	23	70	100	100	81
1984	0-3	484	726	1,863	12,497	-	52	15,622
	3-200	5,843	822	1,044	26,694	7,464	12,754	54,621
	Total	6,327	1,548	2,907	39,191	7,464	12,806	70,243
	EEZ %	92	53	36	68	100	100	78
1985	0-3	2,232	390	7,210	10,354	-	105	20,291
	3-200	5,684	1,370	152	22,801	8,906	13,316	52,229
	Total	7,916	1,760	7,362	33,155	8,906	13,421	72,520
	EEZ %	72	77	2	69	100	99	72
1986	0-3	1,300	-	11,879	10,270	-	-	23,449
	3-200	5,938	-	10	26,218	8,717	12,239	53,122
	Total	7,238	-	11,889	36,486	8,717	12,239	76,571
	EEZ %	82	-	-	72	100	100	69
1987	0-3	718	882	2,399	7,919	-	-	11,918
	3-200	3,447	711	417	27,902	7,669	8,680	48,826
	Total	4,165	1,593	2,816	35,821	7,669	8,680	60,744
	EEZ %	83	45	15	78	100	100	80

- = zero. Source: USDC, 1988b and unpub. prelim. NMFS data.

Table 4. Northern New Jersey Stratified Mean Number and Weight (meats only, lbs) per Tow of Surf Clams from NMFS Surveys, 1965-1986 (Data are standardized to a 60" wide dredge towed for 5 minutes.)**

	Total Index		< 5.5"		≥ 5.5"		% ≥ 5.5"	
Survey	Numbers	Weight	Numbers	Weight	Numbers	Weight	Numbers	Weight
May 65	38	11	15	3	23	8	59	76
Oct 65	36	12	6	1	30	10	83	90
Aug 66	30	10	5	1	25	9	82	92
Jun 69	34	12	4	1	30	11	89	94
Aug 70	26	9	5	1	21	8	81	93
Jun 74	21	7	3	*	19	7	87	94
Apr 76	13	5	2	*	11	4	82	94
Jan 77	2	1	1	*	1	*	43	81
Jan 78	2	*	1	*	1	*	28	65
Dec 78	45	3	44	2	1	*	2	15
Jan 80	32	4	28	3	4	2	13	38
Aug 80	54	8	51	7	3	1	5	14
Aug 81	39	7	31	5	8	3	21	36
Aug 82	113	19	102	16	11	4	10	19
Aug 83	73	13	63	10	10	3	14	26
Jul 84	65	12	53	8	12	4	19	32
Jun 86	46	10	31	5	15	5	32	48

** = no surveys conducted in 1985 and 1987.
* = less than .5.
Source: Murawski and Serchuk, 1984c and Murawski, 1986.

Table 5. Southern New Jersey Stratified Mean Number and Weight (meats only, lbs) per Tow of Surf Clams from NMFS Surveys, 1965-1986 (Data are standardized to a 60" wide dredge towed for 5 minutes.)**

	Total Index		< 5.5"		≥ 5.5"		% ≥ 5.5"	
Survey	Numbers	Weight	Numbers	Weight	Numbers	Weight	Numbers	Weight
May 65	106	20	78	10	28	10	26	51
Oct 65	83	23	33	6	50	17	60	74
Aug 66	70	22	15	3	55	19	79	86
Jun 69	60	20	5	1	54	19	91	95
Aug 70	16	6	3	*	13	5	83	92
Jun 74	49	20	2	*	47	19	96	98
Apr 76	5	2	1	*	5	2	88	96
Jan 77	2	1	1	*	1	*	46	89
Jan 78	15	5	4	*	11	4	74	90
Dec 78	9	2	4	1	4	2	48	76
Jan 80	14	5	3	*	11	5	81	91
Aug 80	15	6	3	*	12	5	80	92
Aug 81	10	5	1	*	10	4	95	99
Aug 82#	21	8	4	*	17	7	83	95
Aug 83	12	5	1	*	10	4	87	95
Jul 84	10	4	1	*	9	4	92	97
Jun 86	19	7	4	1	15	7	77	94

** = no surveys conducted in 1985 and 1987.
* = less than .5.
\# = Index excludes 1 survey tow made at a depth of 42' that yielded 500 surf clams.
Source: Murawski and Serchuk, 1984c and Murawski, 1986.

Table 6. Delmarva Stratified Mean Number and Weight (meats only, lbs) per Tow of Surf Clams from NMFS Surveys, 1965-1986 (Data are standardized to a 60" wide dredge towed for 5 minutes.)**

	Total Index		< 5.5"		≥ 5.5"		% ≥ 5.5"	
Survey	Numbers	Weight	Numbers	Weight	Numbers	Weight	Numbers	Weight
May 65	28	5	16	2	12	3	43	63
Oct 65	28	6	11	1	17	5	62	79
Aug 66	33	8	11	1	22	6	67	82
Jun 69	26	6	8	1	18	5	69	82
Aug 70	20	5	5	1	15	5	76	88
Jun 74	37	10	7	1	30	9	82	91
Apr 76	22	5	7	1	15	5	67	90
Jan 77	11	3	3	*	9	3	76	93
Jan 78	12	3	5	*	7	2	58	85
Dec 78	621	13	616	12	5	2	1	88
Jan 80	69	7	58	4	10	3	15	49
Aug 80	49	6	39	3	9	3	19	52
Aug 81	163	15	157	13	6	2	4	13
Aug 82	109	13	103	10	7	2	6	17
Aug 83	51	8	39	5	12	4	23	44
Jul 84	129	12	119	9	10	3	8	24
Jun 86	105	16	95	13	10	3	10	41

** = no surveys conducted in 1985 and 1987.
* = less than .5.
Source: Murawski and Serchuk, 1984c and Murawski, 1986.

Table 7. Stratified Mean Number per Tow of Surf Clams from NMFS Surveys off Southern Virginia - North Carolina, 1965-1986 (Data are standardized to a 60" wide dredge towed for 5 minutes.)**

Survey	Total Index	< 5.5"	≥ 5.5"	≥ 5.5"
May 65	4	3	1	24
Oct 65#	12	12	*	1
Aug 66#	18	16	1	7
Jun 69	80	79	1	2
Aug 70#	3	1	2	77
Jun 74	30	13	17	58
Apr 76	6	1	5	82
Jan 78	3	1	2	67
Jan 80#	87	86	1	1
Aug 81#	26	18	8	31
Aug 82#	2	1	1	43
Aug 83	10	9	1	11
Jul 84	21	16	5	25
Jun 86	17	13	4	22

** = no surveys conducted in 1985 and 1987.
* = less than .5.
\# = Only a small portion of the total Southern VA - NC area was surveyed.
Source: Murawski and Serchuk, 1984c and Murawski, 1986.

Table 8. Calculations of the Percentages of Surf Clam Resources by Size Interval for Seven Assessment Areas off the Northeast US, Based on the June-July 1986 Survey by the R/V DELAWARE II

	NNJ	SNJ	DMV	SVA -NC	LI	SNE	GBK
Meat weight per tow (kg)	4.57	3.17	7.28	1.14	0.23	0.84	1.72
% of area resource (weight) by length							
0-4.75"	13.6	4.1	35.1	5.3	8.7	3.6	34.3
4.75-5"	9.2	0.3	20.2	9.6	1.4	1.2	12.8
5-5.25"	11.8	0.6	14.8	21.1	1.4	1.2	14.0
5.25-5.5"	17.3	1.0	11.1	36.8	1.4	2.4	17.4
equal to or greater than 5.5"	48.1	94.0	18.8	27.2	87.1	91.6	21.5
Number per tow	45.6	19.0	104.6	16.6	1.8	6.3	26.9
% of area resource (numbers) by length							
0-4.75"	27.8	19.7	47.7	8.0	28.5	18.5	60.5
4.75-5"	11.0	0.4	19.9	11.0	1.1	1.1	9.6
5-5.25"	12.5	0.9	13.8	21.5	1.7	1.6	9.4
5.25-5.5"	16.3	1.6	8.9	37.5	2.2	2.4	10.8
equal to or greater than 5.5"	32.4	77.4	9.7	22.0	66.5	76.4	9.7
Surveyed area (square nautical miles)	3,440	1,228	5,092	2,805	2,945	4,174	5,833
% of surveyed area	13	5	20	11	12	16	23
% of total resource (numbers)	16.5	2.5	56.2	4.9	0.6	2.8	16.5
% of total resource (weight)	21.2	5.3	50.0	4.3	0.9	4.7	13.5

NNJ = Northern New Jersey, SNJ = Southern New Jersey, DMV = Delmarva, SVA-NC = Southern Virginia-North Carolina, LI = Long Island, SNE = Southern New England, and GBK = Georges Bank.
Source: Murawski, 1986.

Table 9. Summary of Surf Clam Catch Data for Survey Strata in the Southern New England Region, 1969-1982. (Data are not adjusted for differences in dredge specifications among surveys.)

Stratum	Depth Range (F)	Area N.M. sq	Number of Tows	Proportion of Non-Zero Catches	Catch per Tow Mean	Catch per Tow SD
37	15-25	672	21	0.14	0.48	1.57
38	25-30	280	21	0.05	0.05	0.22
39	30-40	967	54	-	-	-
40	40-60	513	5	-	-	-
41	15-25	602	39	0.28	0.72	2.28
42	25-30	343	13	-	-	-
43	30-40	432	16	0.06	0.06	0.25
44	40-60	383	1	-	-	-
45	15-25	392	6	0.50	10.00	23.04
46	25-30	416	3	1.00	76.67	80.75
47	30-40	871	11	0.27	0.27	0.47
48	40-60	1109	2	-	-	-
94	5-15	229	2	-	-	-
95	5-15	446	24	0.79	34.00	52.63
96	5-15	495	1	1.00	43.00	-

Source: Murawski and Serchuk, 1983a.

Table 10. Stratified Mean Number of Surf Clams per Tow by Size Interval in Various Sampling Strata on Georges Bank during July-August 1984*

Size Interval (inches)	Stratum 54	61	65	67	68	69	70	71	72	73	74
0.8 - 1.1	-	-	-	0.14	-	0.06	0.06	-	-	-	-
1.2 - 1.5	-	0.50	0.85	0.23	-	0.06	-	-	-	0.13	-
1.6 - 1.9	0.33	-	0.85	0.48	0.14	0.06	-	-	0.21	-	-
2.0 - 2.3	-	0.50	1.40	0.68	0.09	0.28	0.11	-	0.42	0.13	0.29
2.4 - 2.7	-	1.00	1.84	1.44	0.18	0.22	-	1.14	0.32	0.13	-
2.8 - 3.1	0.33	1.00	2.99	2.33	0.27	0.44	-	0.86	1.26	0.25	-
3.2 - 3.5	0.67	0.50	6.09	2.43	0.23	0.22	0.11	1.29	1.58	0.50	-
3.5 - 3.9	0.33	-	10.66	2.06	0.45	0.06	-	1.00	2.74	0.25	0.14
3.9 - 4.3	0.33	-	9.57	2.52	0.23	0.11	0.11	1.86	4.21	0.13	0.29
4.3 - 4.7	0.33	-	11.43	3.15	0.18	-	-	2.43	4.32	-	-
4.7 - 5.1	0.67	-	11.33	7.39	-	0.06	-	4.29	3.26	-	-
5.1 - 5.5	-	-	6.34	17.71	-	-	-	2.43	3.58	-	-
5.5 - 5.9	-	-	1.65	36.11	0.09	0.39	-	1.14	2.21	-	-
5.9 - 6.3	-	-	-	34.99	-	0.89	-	0.14	1.21	-	-
6.3 - 6.7	-	-	-	14.83	-	0.28	-	-	0.11	-	-
6.7 - 7.1	-	-	-	1.50	-	0.17	-	-	-	-	-
7.1 - 7.4	-	-	-	-	-	-	-	-	-	-	-
7.5 - 7.8	-	-	-	-	-	0.06	-	-	-	-	-
Total No. Per Tow	3.00	3.50	65.14	127.90	1.86	3.33	0.33	16.57	25.42	1.50	0.71
No. of Tows	3	2	7	31	22	18	9	7	19	8	7

* Survey included some 5-minute and some 1-minute tow durations.
Strata 57, 59, and 63 were sampled (1, 2, and 2 tows, respectively) but had no catch.
Source: Murawski and Serchuk, 1984b.

Table 11. Stratified Mean Number of Surf Clams per Tow* during NMFS Surveys of Georges Bank, 1980-1984#

Stratum	Mean Number Per Tow	Number of Tows	Proportion of Georges Bank Area**
54	2.20	5	0.0302
55	0.50	2	0.0396
57	2.00	4	0.0200
59	0.25	12	0.0585
60	-	2	0.0881
61	0.57	14	0.0627
62	-	3	0.0763
63	0.50	8	0.0755
64	-	2	0.1075
65	56.00	12	0.0178
66	-	1	0.0289
67	121.48	33	0.0228
68	2.00	27	0.0403
69	2.55	33	0.1021
70	1.28	18	0.0566
71	14.63	8	0.0159
72	27.31	26	0.0548
73	1.35	17	0.0545
74	0.85	13	0.0471

= no surveys conducted in 1985 and 1987.
*Survey tows during 1980-1983 were 5 minutes duration, tows during 1984 were 1 and 5 minutes duration.
**See Figure 1 for Stratum Areas.
Source: Murawski and Serchuk, 1984b.

Table 12. Ocean Quahog Number Per Tow Index and Minimum Population Estimates

Area	Number Per Tow Index 1980-1982	1986	Change	Minimum Population Estimates (millions of pounds) 1980-1982	1986	Change	% of Resource
Southern VA-NC	0.56	0.18	-68%	3.41	0.45	-87%	*
Delmarva	47.63	43.57	-9	198.41	184.69	-7	7%
New Jersey	99.16	117.05	+ 18	511.52	600.10	17	23
Long Island	245.78	243.51	-1	499.77	605.61	21	23
Southern New England	230.56	208.65	-10	693.01	571.19	-18	22
Georges Bank	213.37	197.80	-7	762.77	615.47	-19	24
Total	N/A	N/A	N/A	2,668.90	2,577.50	-3	100

* = less than 0.5%.
Source: USDC, 1986.

Table 13. Calculated Mean Shell Lengths (in.) and Drained Meat Weights (lbs) at Age for Middle Atlantic FCZ Surf Clam Populations*

Age	New Jersey Shell Length	New Jersey Meat Weight	Delmarva Shell Length	Delmarva Meat Weight
1	1.6	0.01	1.6	0.01
2	2.8	0.04	2.9	0.03
3	3.7	0.08	3.8	0.08
4	4.4	0.13	4.5	0.12
5	4.9	0.18	5.0	0.16
6	5.3	0.23	5.4	0.20
7	5.6	0.27	5.7	0.24
8	5.8	0.30	5.9	0.26
9	6.0	0.32	6.1	0.28
10	6.1	0.35	6.2	0.29
11	6.2	0.36	6.3	0.31
12	6.3	0.37	6.4	0.32
13	6.4	0.39	6.4	0.32
14	6.4	0.39	6.5	0.33
15	6.5	0.40	6.5	0.33
16	6.5	0.40	6.5	0.33
17	6.5	0.41	6.5	0.34
18	6.5	0.41	6.5	0.34
19	6.5	0.41	6.5	0.34
20	6.5	0.41	6.5	0.34
21	6.5	0.42	6.5	0.34
22	6.6	0.42	6.6	0.34
23	6.6	0.42	6.6	0.34
24	6.6	0.42	6.6	0.34

* = Surf clams are spawned in late summer-autumn, so a 1 October birthdate is assumed.
Source: Murawski and Serchuk, 1981.

Table 14. Size Distribution (% by number) of Georges Bank FCZ Surf Clam, Summer 1984

Size Interval (")	Research Vessel Survey	Interview Samples	Observer Samples
0.8 - 1.1	0.10	-	-
1.2 - 1.5	1.00	-	0.02
1.6 - 1.9	0.90	-	0.06
2.0 - 2.3	2.30	-	0.11
2.4 - 2.7	2.79	-	0.13
2.8 - 3.1	5.09	-	0.28
3.2 - 3.5	5.79	-	0.41
3.5 - 3.9	6.99	-	0.78
3.9 - 4.3	8.08	-	1.24
4.3 - 4.7	8.48	-	2.05
4.7 - 5.1	9.28	-	4.76
5.1 - 5.5	11.88	5.59	11.33
5.5 - 5.9	16.07	28.07	26.02
5.9 - 6.3	14.77	47.78	34.89
6.3 - 6.7	5.69	18.24	15.83
6.7 - 7.1	0.80	0.32	2.07
7.1 - 7.4	0.00	-	0.02
7.5 - 7.8	0.01	-	-
Mean Shell Length	4.80	6.02	5.83
Number of samples	138*	15	19**

* Stratified mean catch per tow (numbers) at length based on 138 survey stations sampled during July-August 1984.

** Number of trips sampled by NMFS observers; a total of 25,413 clams were measured.

Source: Murawski and Serchuk, 1984b.

Table 15. Yield per Recruit (Y, grams, meat weight) and Proportion (%) of Maximum Yield per Recruit of Surf Clams from New Jersey and Delmarva FCZ Waters for Various Fishing Mortality Rates (F) and Assumed Harvested Sizes

	New Jersey										Delmarva									
	4.50"		4.75"		5.00"		5.25"		5.50"		4.50"		4.75"		5.00"		5.25"		5.50"	
F	Y	%	Y	%	Y	%	Y	%	Y	%	Y	%	Y	%	Y	%	Y	%	Y	%
0.1	12	93	11	89	11	82	10	75	8	66	11	94	10	90	10	84	9	77	8	68
0.2	17	96	17	91	16	86	14	79	13	70	16	96	15	92	14	87	13	81	12	72
0.3	20	97	19	94	18	89	17	82	15	73	18	98	18	95	17	90	16	84	14	76
0.4	22	99	21	96	20	91	19	85	17	76	20	99	19	97	19	93	17	87	16	79
0.5	23	99	22	97	21	93	20	87	18	78	21	100	20	98	20	94	18	89	17	81
0.6	23	100	23	98	22	94	21	88	19	80	21	100	21	99	20	96	19	90	18	82
0.7	24	100	23	99	23	95	21	90	19	81	22	100	21	99	21	96	20	91	18	84
0.8	24	100	24	99	23	96	22	90	20	82	22	100	22	99	21	97	20	92	19	85
0.9	24	100	24	99	23	96	22	91	20	83	22	100	22	100	22	98	21	93	19	86
1.0	24	100	24	100	24	97	22	92	20	84	22	100	22	100	22	98	21	94	19	86
1.1	25	100	25	100	24	97	23	92	21	84	22	100	22	100	22	98	21	94	19	87
1.2	25	100	25	100	24	98	23	93	21	85	22	100	22	100	22	98	21	94	20	87
1.3	25	100	25	100	24	98	23	93	21	86	22	99	23	100	22	99	21	95	20	88
1.4	25	100	25	100	24	98	23	94	21	86	22	99	23	100	22	99	21	95	20	88
1.5	25	100	25	100	24	98	23	94	21	86	22	99	23	100	22	99	22	95	20	89
1.6	25	99	25	100	24	98	23	94	22	87	22	99	23	100	22	99	22	95	20	89
1.7	25	99	25	100	25	98	24	94	22	87	22	99	23	100	23	99	22	96	20	89
1.8	25	99	25	100	25	99	24	94	22	87	22	99	23	100	23	99	22	96	20	89
1.9	25	99	25	100	25	99	24	95	22	87	22	99	23	100	23	99	22	96	20	90
2.0	25	99	25	100	25	99	24	95	22	87	22	98	23	100	23	99	22	96	20	90

Source: Murawski, 1983, pers. comm.

Table 16. Calculated Age and Number of Spawnings for New Jersey and Delmarva Area FCZ Surf Clams

	Clam Length (inches)						
	4.00	4.25	4.50	4.75	5.00	5.25	5.50
New Jersey FCZ							
Calculated Age (years)	3.4	3.8	4.2	4.7	5.2	5.9	6.6
Number of Spawnings*	1 +	2 +	2 +	3 +	3 +	4 +	4-5 +
Delmarva FCZ							
Calculated Age (years)	3.2	3.6	4.0	4.4	4.9	5.5	6.2
Number of Spawnings*	1 +	1-2 +	2 +	2-3 +	3 +	3-4 +	4 +

* Some surf clams spawn at age 1 year, most do not initiate spawning until age 2.
\+ Some individuals have spawned once more than the indicated number.
Source: Murawski, 1983, pers. comm.

Table 17. Yield per Recruit (grams, drained meat weight) of Ocean Quahogs from Two EEZ Fishery Areas off the Northeast US.

				Fishing Mortality Rate (F)									
Area	M	t_c	L_c	.01	.02	.03	.04	.05	.06	.07	.08	.09	.10
New Jersey	.01	12	50	10.93	13.31	13.45	13.05	12.57	12.11	11.70	11.35	11.05	10.78
		17	60	11.07	13.85	14.30	14.13	13.81	13.49	13.20	12.94	12.71	12.52
		28	70	11.00	14.40	15.38	15.57	15.37	15.23	15.08	14.95	14.95	14.83
		45	80	10.31	14.28	15.85	16.48	16.74	16.85	16.88	16.88	16.87	16.85
	.02	12	50	6.66	8.97	9.79	10.05	10.09	10.03	9.93	9.82	9.70	9.59
		17	60	6.59	9.07	10.08	10.51	10.69	10.76	10.77	10.75	10.72	10.68
		28	70	6.14	8.74	9.95	10.57	10.92	11.12	11.25	11.32	11.38	11.41
		45	80	5.13	7.60	8.89	9.63	10.09	10.40	10.62	10.78	10.90	10.99
	.03	12	50	4.48	6.53	7.54	8.07	8.36	8.52	8.59	8.63	8.63	8.62
		17	60	4.31	6.39	7.50	8.14	8.53	8.78	8.95	9.06	9.14	9.20
		28	70	3.72	5.65	6.76	7.44	7.90	8.21	8.44	8.62	8.75	8.85
		45	80	2.73	4.26	5.19	5.80	6.23	6.54	6.78	6.97	7.11	7.24
Delmarva	.01	12	50	11.93	14.64	14.89	14.53	14.06	13.60	13.19	12.83	12.52	12.24
		17	60	12.05	15.17	15.77	15.65	15.36	15.05	14.76	14.50	14.28	14.08
		28	70	11.92	15.68	16.81	17.07	17.05	16.94	16.81	16.68	16.55	16.44
		45	80	11.09	15.41	17.14	17.87	18.18	18.32	18.37	18.39	18.39	18.38
	.02	12	50	7.32	9.93	10.90	11.25	11.33	11.31	11.23	11.13	11.02	11.91
		17	60	7.22	10.00	11.16	11.69	11.93	12.03	12.07	12.07	12.05	12.02
		28	70	6.68	9.55	10.91	11.63	12.03	12.28	12.44	12.54	12.61	12.66
		45	80	5.54	8.22	9.63	10.46	10.97	11.32	11.57	11.75	11.89	12.00
	.03	12	50	4.93	7.27	8.43	9.07	9.42	9.62	9.74	9.79	9.82	9.82
		17	60	4.76	7.08	9.38	9.08	9.54	9.84	10.05	10.19	10.29	10.37
		28	70	4.07	6.20	7.43	9.20	9.82	9.08	9.35	9.55	9.71	9.83
		45	80	2.95	4.62	5.64	6.31	6.78	7.13	7.39	7.60	7.77	7.90

M = instantaneous natural mortality rate.
t_c = age at first selection.
L_c = shell size (mm) at first selection.
Source: Murawski and Serchuk, 1983b.

Table 18. Simulation Results for Program MSPROB Based on Various Constant Catch Levels

Parameter	Constant Catch Level (millions of lbs) 22	45	55	66	88	99	110
F							
Mean	0.038	0.055	0.199	0.734	1.831	1.573	1.728
Standard Deviation	0.023	0.029	0.402	1.010	1.117	1.140	1.149
Coefficient of Variation	0.61	0.52	2.02	1.38	0.61	0.72	0.66
Catch (millions of lbs)							
Mean	22	45	55	59	51	65	64
Standard Deviation	-	-	2.2	15.1	30.5	36.0	41.5
Coefficient of Variation	-	-	0.04	0.26	0.59	0.55	0.64
Stock size (millions of lbs)							
Mean	947	1,166	978	524	261	329	334
Standard Deviation	461	396	584	332	305	306	342
Coefficient of Variation	0.48	0.33	0.59	0.63	1.17	0.93	1.02
Proportion of Years < Constant Catch	0.00	0.00	0.02	0.20	0.61	0.49	0.58

Source: USDC, 1988.

Table 19. Mid-Atlantic Surf Clam Biomass Estimates (weight) Based upon Areal Expansion of Survey Catch per Tow Data, 1984

Assessment Region	(1) Area of Region (sq n mi)	(2) Mean Catch/Tow (lbs)	Biomass estimate (millions of lbs)	% of Resource
ALL SURF CLAMS				
Northern New Jersey	3,440	10.1	325	26
Southern New Jersey	1,228	7.0	80	6
Delmarva	5,092	16.1	769	62
Southern Virginia-North Carolina	2,980	2.5	70	6
Total	12,740		1,244	100
SURF CLAMS GREATER THAN 5.5"				
Northern New Jersey	3,440	4.8	154	39
Southern New Jersey	1,228	6.6	76	19
Delmarva	5,092	3.0	143	36
Southern Virginia-North Carolina	2,980	0.7	20	5
Total	12,740		393	100

(1) - Murawski and Serchuk, 1984c.
(2) - Murawski, 1986.

Table 20. Logbook Reported EEZ Surf Clam and Ocean Quahog Landings (thousands of bu), 1983-1987

	1983	1984	1985	1986	1987	Total
SURF CLAMS						
Landings						
from logbooks	2,411	2,968	2,915	3,181	2,820	14,295
from Fisheries of the US	2,657	3,213	3,072	3,125	2,872	14,939
Logbook % of total	91	92	95	102	98	96
Bushels (×000) 10' Sq CPUE	2,098	2,615	2,447	2,787	2,6345	12,581
% for 10' Sq CPUE	87	88	84	88	93	88
Number of trips	4,784	3,730	3,125	2,741	2,731	17,111
QUAHOGS						
Landings						
from logbooks	3,216	3,963	4,569	4,167	4,743	20,658
from Fisheries of the US	3,369	3,617	5,196	4,359	4,900	21,440
Logbook % of total	95	110	88	96	97	96
Bushels (×000) 10' Sq. CPUE	3,137	3,704	4,131	3,978	4,635	19,584
% for 10' Sq CPUE	98	93	90	95	98	95
Number of trips	2,468	3,205	3,712	3,185	3,324	15,894

Source: NMFS NER logbook data.

Table 21. Annual Extraction from 10' Squares Where More Than 100,000 Bu of Surf Clams Were Removed, 1983-1987

Year	Square	No. of Vessels	Trips	Bushels
1983	367412	20	152	126,984
	377412	29	399	214,509
	397445	32	287	112,551
	397455	36	445	195,810
	397464	24	229	114,999
	Total		1,512	764,853
	%		25	32
1984	377412	25	161	122,881
	387431	27	295	177,549
	397445	36	364	234,789
	397455	35	213	134,984
	397463	38	206	152,007
	397464	51	626	465,447
	Total		1,865	1,287,657
	%		50	43
1985	377564	33	361	449,166
	377565	21	74	104,358
	387431	28	118	100,090
	397445	32	257	178,738
	397463	39	210	145,123
	397464	85	681	570,196
	Total		1,701	1,547,671
	%		54	53
1986	387431			163,436
	397463			914,260
	397464			684,858
	Total			1,762,554
	%			55
1987	397312			226,704
	397445			142,732
	397463			888,977
	397464			610,239
	Total			1,869,239
	%			66

Source: NMFS NER logbook data.

Table 22. Extraction and CPUE from 10' Squares Where More Than 100,000 Bu of Surf Clams Were Removed Within 1 Year, 1983-1987

Square	Year	Bushels	CPUE	Adjusted CPUE
367412	1983	126,984	69	112
	1984	8,406	69	106
	1985	*	295	295
	1986	-	-	-
	1987	-	-	-
	Total	135,390		
377412	1983	214,509	49	76
	1984	122,881	71	114
	1985	29,574	207	319
	1986	67,722	194	419
	1987	36,992		353
	Total	471,678		
377564	1983	14,476	58	84
	1984	66,768	122	183
	1985	449,166	214	338
	1986	78,959	274	365
	1987	3,384		282
	Total	612,753		
377565	1983	13,655	50	74
	1984	76,854	92	138
	1985	104,358	251	367
	1986	66,017	234	411
	1987	11,767		456
	Total	272,651		
387431	1983	91,495	34	90
	1984	177,549	60	149
	1985	100,090	147	340
	1986	163,436	180	446
	1987	69,673		403
	Total	602,243		
397445	1983	112,551	40	110
	1984	234,789	69	183
	1985	178,738	122	320
	1986	85,659	184	476
	1987	142,732		534
	Total	754,469		
397455	1983	195,810	53	131
	1984	134,984	69	171
	1985	74,325	125	326
	1986	27,862	198	498
	1987	34,436		408
	Total	467,417		
397463	1983	30,149	42	108
	1984	152,007	87	208
	1985	145,123	122	298
	1986	914,260	199	423
	1987	688,977		378
	Total	1,930,516		
397464	1983	114,999	57	141
	1984	465,447	80	200
	1985	570,196	148	329
	1986	684,858	204	381
	1987	610,826		342
	Total	2,446,326		

* = Data confidential because fewer than 3 vessels in category.
Source: NMFS NER logbook data.

Table 23. Annual Extraction from 10' Squares Where More Than 100,000 Bu of Ocean Quahogs Were Removed, 1983-1987

Year	Square	No. of Vessels	Trips	Bushels
1983	377422	7	237	369,789
	377431	10	288	426,761
	377432	9	182	245,209
	387312	4	106	120,072
	387313	8	251	369,908
	387443	12	118	118,588
	387451	19	247	228,690
	387453	11	163	180,894
	387461	12	146	168,990
	387463	10	227	314,921
	397466	8	126	137,797
	Total		2,091	2,681,619
	%		86	85
1984	377422	12	177	235,845
	377431	17	389	480,588
	377432	11	210	317,757
	377441	11	184	244,273
	387312	11	241	275,874
	387313	9	124	191,583
	387443	11	179	224,767
	387451	18	207	215,967
	387453	10	99	113,883
	387461	13	162	155,724
	387462	11	190	231,206
	387463	13	349	447,050
	Total		2,511	3,134,517
	%		83	84
1985	377422	10	131	223,276
	377431	16	301	418,142
	377432	9	63	124,192
	377441	13	387	552,922
	387312	15	129	154,770
	387313	13	203	247,043
	387451	13	158	148,535
	387453	11	131	156,349
	387461	15	111	126,076
	387462	24	446	548,648
	387463	19	199	285,559
	407325	6	94	105,117
	407325	8	129	148,744
	Total		2,482	3,239,373
	%		76	78
1986	377421			149,948
	377422			430,102
	377431			470,239
	377432			313,870
	377441			242,998
	387312			256,290
	387452			128,021
	387461			123,059
	387462			266,989
	387463			125,689
	407346			185,280
	Total			2,692,485
	%			65
1987	377422			407,667
	377431			608,216
	377432			222,926
	377441			464,145
	387311			250,510
	387312			209,222
	387313			117,895
	387452			118,126
	387453			186,336
	387454			160,216
	387462			319,583
	387463			147,135
	407335			117,045
	407345			118,914
	407346			156,933
	407354			134,145
	Total			3,739,014
	%			79

Source: NMFS NER logbook data.

Table 24. Extraction and CPUE from 10' Squares Where More Than 100,000 Bu of Ocean Quahogs Were Removed Within 1 Year, 1983-1985

Square	Year	Bushels	CPUE	Adjusted CPUE
377421	1983	5,226	131	307
	1984	40,888	129	243
	1985	15,363	144	248
	1986	149,948	148	219
	1987	73,472	153	212
	Total	284,897		
377422	1983	369,789	180	444
	1984	235,781	150	285
	1985	223,276	171	280
	1986	430,102	144	284
	1987	407,667	141	273
	Total	1,666,615		
377431	1983	426,761	177	428
	1984	478,540	134	297
	1985	418,142	146	310
	1986	470,239	154	281
	1987	608,216	151	249
	Total	2,401,898		
377432	1983	245,209	170	430
	1984	317,757	159	379
	1985	124,192	167	285
	1986	313,870	144	329
	1987	222,926	145	264
	Total	1,223,954		
377441	1983	12,396	188	496
	1984	243,125	166	377
	1985	552,922	180	382
	1986	242,998	157	332
	1987	464,145	139	288
	Total	1,515,586		
387311	1983	39,652	152	336
	1984	79,614	114	270
	1985	59,356	107	225
	1986	95,652	141	303
	1987	250,570	129	233
	Total	524,784		
387312	1983	120,072	113	361
	1984	275,874	135	318
	1984	152,100	126	265
	1986	256,290	138	288
	1987	209,222	131	290
	Total	1,013,558		
387313	1983	369,908	180	439
	1984	191,583	152	280
	1985	247,043	121	274
	1986	99,856	109	253
	1987	117,895	157	319
	Total	1,026,285		
387443	1983	114,032	99	237
	1984	224,767	114	211
	1985	53,310	85	203
	1986	8,664	87	188
	1987	14,400	103	214
	Total	415,173		
387451	1983	218,454	97	245
	1984	212,309	102	229
	1985	147,767	101	272
	1986	75,204	91	245
	1987	38,514	90	276
	Total	692,248		
387452	1983	12,112	135	378
	1984	16,560	122	352
	1985	31,822	134	346
	1986	128,021	134	316
	1987	118,126	105	291
	Total	306,641		

Table 24. (continued)

Square	Year	Bushels	CPUE	Adjusted CPUE
387453	1983	180,894	118	341
	1984	112,859	114	313
	1985	156,349	148	372
	1986	88,233	130	322
	1987	186,336	137	332
	Total	724,671		
387454	1983	-	-	-
	1984	-	-	-
	1985	1,792	179	448
	1986	9,740	94	165
	1987	100,216	150	328
	Total	171,748		
387461	1983	168,990	105	258
	1984	154,409	90	220
	1985	126,012	109	264
	1986	123,059	106	250
	1987	51,910	116	261
	Total	624,380		
387462	1983	82,926	137	386
	1984	231,206	140	346
	1985	548,648	133	318
	1986	266,989	128	314
	1987	319,583	134	307
	Total	1,449,352		
387463	1983	314,921	164	431
	1984	447,050	149	363
	1985	285,559	142	265
	1986	125,689	143	321
	1987	147,135	132	289
	Total	1,320,354		
397466	1983	137,797	98	215
	1984	44,841	90	213
	1985	49,598	114	270
	1986	24,703	117	274
	1987	15,852	121	250
	Total	272,791		
407325	1983	-	-	-
	1984	35,682	115	290
	1985	105,117	157	335
	1986	71,658	244	419
	1987	35,964	127	249
	Total	248,421		
407335	1983	-	-	-
	1984	46,436	137	334
	1985	148,744	140	298
	1986	86,740	144	329
	1987	117,045	130	289
	Total	398,965		
407345	1983	-	-	-
	1984	-	-	-
	1985	8,484	103	250
	1986	34,245	238	403
	1987	118,914	325	527
	Total	161,643		
407346	1983	-	-	-
	1984	896	112	299
	1985	32,117	175	315
	1986	185,280	216	380
	1987	156,933	139	247
	Total	375,226		
407354	1983	-	-	-
	1984	-	-	-
	1985	-	-	-
	1986	19,325	339	537
	1987	134,145	339	537
	Total	153,470		

Source: NMFS NER logbook data.

Table 25. Preliminary Ranking of Major Threats to Living Marine Resources and Habitats in the Northeast.

1. Urban and Port Development *
2. Ocean Disposal #
3. Dams
4. Agricultural Practices ●
5. Industrial Waste Discharges @
6. Domestic Waste Discharges @
7. OCS Oil and Gas Development
8. Insect Control
9. Water Diversion
10. Sand and Gravel Mining
11. Power Generation

* Includes dredge and fill and construction activities covered by Section 10/104 permits, as well as point source pollution covered by NPDES permits and non-point source pollution.

Includes dredged material disposal in State waters, as well as actual ocean dumping of dredged material, sewage sludge, etc., covered by Section 103 permits.

● Includes non-point source pollution (fertilizers, animal wastes, biocides, sediments, heavy metals, etc.) that affects coastal aquatic areas.

@ Point source pollution covered by NPDES permits.

Source: USDC, 1985b.

Table 26. Mid-Atlantic Area Surf Clam Number of Vessels, Number of Trips, Hours at Sea, Hours Fishing, Landings (bushels), and Catch per Unit Effort (bu/hour fishing)

Year	Class	Vessels	Trips	Hours at Sea	Hours Fishing	Landings	CPUE
1979	1	26	584	9080	5787	103665	17
	2	61	1992	39369	22670	484151	21
	3	75	2622	59298	34326	1086393	32
	All	162	5198	107747	62783	1674209	26
1980	1	14	406	5674	3650	79621	19
	2	54	2164	38743	23996	597646	24
	3	59	2323	53098	31153	1246766	40
	All	127	4893	97515	58799	1924033	32
1981	1	16	328	4701	2927	64942	22
	2	48	1502	25029	14507	572063	37
	3	59	2198	47664	23555	1339433	56
	All	123	4028	77394	40989	1976438	47
1982	1	15	511	7535	4908	97833	20
	2	47	2037	32906	20916	614069	28
	3	53	2734	55855	29721	1290928	42
	All	115	5282	96296	55545	2002830	35
1983	1	14	408	6323	4025	113753	28
	2	47	2026	29975	19100	814999	41
	3	52	2260	46750	24518	1395368	56
	All	113	4694	83048	47643	2324120	47
1984	1	14	312	4535	2988	124897	41
	2	49	1678	24237	15386	1102805	69
	3	52	1420	26626	13993	1334475	91
	All	115	3410	55398	32367	2562177	76
1985	1	12	188	2042	1074	85215	79
	2	48	1211	14427	6643	908066	132
	3	65	1302	21910	7196	1514599	200
	All	125	2701	38379	14913	2507880	161
1986	1	12	159	1844	887	80893	91
	2	50	871	11108	4659	804272	166
	3	73	1322	26392	7323	1849026	240
	All	135	2352	39344	12869	2734191	203
1987	1	8	104	1261	558	50784	90
	2	50	926	12076	5088	809829	155
	3	75	1312	26736	7396	1694124	222
	All	133	2342	40073	13042	2554737	190

Source: NMFS Logbook Files.

Table 27. Nantucket Shoals Area Surf Clam Number of Vessels, Number of Trips, Hours at Sea, Hours Fishing, Landings (bushels), and Catch per Unit Effort (bu/hour fishing)

Year	Class	Vessels	Trips	Hours at Sea	Hours Fishing	Landings	CPUE
1983	All	12	90	2563	963	87820	91
1984	1 & 2	3	77	2757	1285	37817	29
	3	6	24	774	377	25193	67
	All	9	101	3531	1662	63010	38
1985	1 & 2	3	105	994	562	41265	24
	3	3	90	3112	1684	74591	36
	All	6	195	4106	2246	115856	33
1986	1 & 2	6	125	2167	1207	103608	33
	3	10	105	3304	2081	103044	40
	All	16	230	5471	3288	206652	37
1987	1	3	55	1448	676	17222	25
	2	5	183	4195	2442	81010	23
	3	3	58	1537	726	53875	49
	All	11	296	7180	3844	152107	28

Source: NMFS Logbook Files.

Table 28. Georges Bank Area Surf Clam Number of Vessels, Number of Trips, Hours at Sea, Hours Fishing, Landings (bushels), and Catch per Unit Effort (bu/hour fishing)

Year	Class	Vessels	Trips	Hours at Sea	Hours Fishing	Landings	CPUE
1984	1 & 2	3	15	709	238	13665	58
	3	14	194	7493	2129	328174	134
	All	17	209	8202	2367	341839	126
1985	1 & 2	4	20	598	225	15558	69
	3	16	190	7511	2960	270036	88
	All	20	210	8109	3185	285594	86
1986	All	10	159	6574	1597	239799	149
1987	All	6	97	4191	959	112975	118

Source: NMFS Logbook Files.

Table 29. Ocean Quahog Number of Vessels, Number of Trips, Hours at Sea, Hours Fishing, Landings (bushels), and Catch per Unit Effort (bu/hour fishing)

Year	Class	Vessels	Trips	Hours at Sea	Hours Fishing	Landings	CPUE
1979	1 & 2	22	735	10325	4333	477346	109
	3	37	1966	35635	19545	2557350	127
	All	59	2701	45960	23878	3034696	124
1980	1 & 2	19	561	7836	3528	354110	95
	3	33	1950	39488	22025	2607679	114
	All	52	2511	47324	25553	2961789	111
1981	1 & 2	12	399	5965	2793	248498	88
	3	35	2011	37914	20859	2639789	125
	All	47	2410	43879	23652	2888287	121
1982	1 & 2	12	274	4414	2391	187447	77
	3	31	2146	39956	21515	3053328	136
	All	43	2420	44370	23906	3240775	130
1983	1 & 2	8	225	3561	1936	159214	81
	3	29	2243	40718	21072	3056426	142
	All	37	2468	44279	23008	3215640	137
1984	1 & 2	16	467	7266	3873	369529	92
	3	41	2738	51563	26845	3593438	129
	All	57	3205	58829	30718	3962967	124
1985	1 & 2	17	611	9352	4756	483004	99
	3	47	3101	58462	28988	4086505	138
	All	64	3712	67814	33744	4569509	133
1986	1 & 2	16	471	8795	4159	441192	103
	3	56	2714	51648	25292	3726013	146
	All	72	3185	60443	29451	4167205	140
1987	1 & 2	16	333	7359	3405	359042	105
	3	55	2995	59220	29482	4383983	146
	All	71	3328	66579	32887	4743025	142

Source: NMFS Logbook Files.

Table 30. Mid-Atlantic Allowable Surf Clam Fishing Time (hours/week)
17 November 1977 - 31 December 1987*

Date	Hrs/wk	Number of Weeks	Number of Hours
11/17/77	48	6	288
1/1/78	96	4	384
1/30/78	48	6	288
3/10/78	Close	3	-
4/1/78	48	5	240
5/7/78	24	21	504
10/1/78	36	4	144
10/30/78	24	8	192
12/21/78	Close	1	-
1/1/79	24	9	216
2/27/79	36	5	180
4/1/79	24	27	648
10/15/79	36	11	396
1/1/80	24	9	216
2/18/80	36	6	216
3/31/80	24	3	72
4/20/80	36	4	144
5/18/80	48	6	288
6/29/80	24	1	24
7/7/80	48	9	432
9/28/80	24	14 (80), 29 (81)	336 (80), 696 (81)
7/21/81	12	23	276
1/4/82	24	52 (82), 52 (83), 8 (84)	1,248 (82), 1,248 (83), 192 (84)
2/26/84	12	17	204
6/24/84	Close	2	-
7/8/84	12	10	120
9/16/84	Close	2	-
9/30/84	12	7	84
11/18/84	6 every other	4	12
12/16/84	6	1	6
12/23/84	Close	1	-
12/30/84	6	19	114
5/12/85	6 every other	6	18
6/23/85	Close	2	-
7/5/85	6 every other	24	72
12/19/85	Close	2	-
12/29/85	6 every other	26	78
6/27/86	Close	2	-
7/11/86	6 every other	21	60
12/5/86	Close	4	-

*In 1987 the number of allowed trips was 25 (7, 5, 7, and 8 for the 1st through 4th quarters, respectively). Each trip was limited in duration to 6 hours.

Table 31. Mid-Atlantic Allowed Surf Clam Fishing Time by Weeks, 1978-1987#

					Hours/Week				
	Close	6 every other	6	12	24	36	48	96	Total
1978	4	-	-	-	29	4	11	4	
1979	-	-	-	-	36	16	-	-	
1980	-	-	-	-	27	10	15	-	
1981	-	-	-	23	29	-	-	-	
1982	-	-	-	-	52	-	-	-	
1983	-	-	-	-	52	-	-	-	
1984	5	4	1	34	8	-	-	-	
1985	4	30	19	-	-	-	-	-	
1986	6	47	-	-	-	-	-	-	
Total	19	81	20	57	233	30	26	4	460
	4%	18%	4%	12%	51%	7%	6%	*	100%

* = less than 0.5%.
#In 1987 the number of allowed trips was 25 (5, 5, 7, and 8 for the 1st through 4th quarters, respectively). Each trip was limited in duration to 6 hours.

Table 32. Mid-Atlantic Allowed Surf Clam Fishing Time by Hours, 1978-1987#

				Hours/Week					
	6 every other	6	12	24	36	48	96	Total	Change
1978	-	-	-	696	144	528	384	1,752	
	-	-	-	40%	8%	30%	22%	100%	
1979	-	-	-	864	576	-	-	1,440	-18%
	-	-	-	60%	40%	-	-	100%	
1980	-	-	-	648	360	720	-	1,728	20%
	-	-	-	38%	21%	42%	-	100%	
1981	-	-	276	696	-	-	-	972	-44%
	-	-	28%	72%	-	-	-	100%	
1982	-	-	-	1,248	-	-	-	1,248	28%
	-	-	-	100%	-	-	-	100%	
1983	-	-	-	1,248	-	-	-	1,248	-
	-	-	-	100%	-	-	-	100%	
1984	12	6	408	192	-	-	-	618	-50%
	2%	1%	66%	31%	-	-	-	100%	
1985	90	114	-	-	-	-	-	204	-67%
	44%	56%	-	-	-	-	-	100%	
1986	138	-	-	-	-	-	-	138	
	100%	-	-	-	-	-	-	100%	
Total	240	120	684	5,592	1,080	1,248	384	9,348	
	3%	1%	7%	60%	12%	13%	4%	100%	

#In 1987 the number of allowed trips was 25 (5, 5, 7, and 8 for the 1st through 4th quarters, respectively). Each trip was limited in duration to 6 hours.

Table 33. Ownership Transfers of Vessels with Moratorium (SF-1) Surf Clam Permits

Year	Valid SF-1 Permits	Active SF-1 Permits	Transfers #	Transfers %
1979	na	162	na	na
1980	167	127	6	3.6
1981	145	123	15	10.3
1982	146	115	13	8.9
1983	148	113	9	6.1
1984	145	115	16	11.0
1985	145	125	41	28.3
1986	144	135	16	11.1
1987	142	133	19	13.4

na = not applicable.
Source: NMFS permit files and logbook files.

Table 34. Number of Valid Moratorium Permits and New England and Ocean Quahog Permits by Year

Year	Valid SF-1	Active SF-1	Valid SF-6	Valid SF-7
1977	184	155	na	na
1978	na	157	na	na
1979	na	162	na	na
1980	167	127	63	110
1981	145	123	65	145
1982	146	115	84	209
1983	148	113	156	362
1984	145	115	366	561
1985	145	125	568	746
1986	144	135	658	836
1987	142	133	993	1183

Note: Some vessels have both SF-6 and SF-7 permits, and a few vessels have all three.
na = not applicable.
Source: NMFS permit files and logbook files.

Table 35. Activity Level of Surf Clam/Ocean Quahog Fleet as Measured by Number of Vessels with Logbook Recorded Catch

Year	Surf Clams Mid-Atlantic only	Surf Clams New England only	Surf Clams Mid-Atlantic & New England	Ocean Quahogs only	Surf Clams & Ocean Quahogs	Total
1979	121	-	-	9	51	181
1980	82	-	-	8	45	135
1981	81	-	-	5	42	128
1982	80	-	-	8	35	123
1983	78	2	8	8	29	125
1984	66	2	8	14	43	133
1985	63	3	6	6	58	136
1986	67	7	0	2	70	146
1987	66	8	0	3	68	145

Source: NMFS logbook files.

Table 36. Age of Vessels Permitted to Take Surf Clams and/or Ocean Quahogs Which Were Active in 1987

	Moratorium		New England/Quahog	
Age	Number	%	Number	%
0-10	20	14	3	25
11-20	53	37	2	17
21-30	23	16	6	50
31-40	22	15	1	8
41-70	18	13	-	-
> 70	6	4	-	-
Total	142		12*	

*Only 12 vessels active of over 1,000 permitted as SF-6 and/or SF-7. Source: NMFS permit files.

Table 37. Surf Clam Ex-Vessel Value (millions of $) and Distribution (%) by State, 1950-1987

	NE		NY		NJ		DE		MD		VA		Total#	
	Val	%	Val	%	Val	%	Val	%	Val	%	Val	%	Val	%
1950	*	1	*	43	*	54	-	-	*	1	-	-	1	100
1951	*	1	*	36	1	52	-	-	*	12	-	-	1	100
1952	*	*	*	31	1	57	-	-	*	12	-	-	1	100
1953	-	-	*	30	1	56	-	-	*	15	-	-	1	100
1954	*	2	*	29	1	58	-	-	*	12	-	-	1	100
1955	*	*	*	19	1	71	-	-	*	10	-	-	1	100
1956	*	2	*	17	1	72	*	-	*	10	-	-	2	100
1957	*	*	*	10	2	83	*	*	*	6	-	-	2	100
1958	*	-	*	4	1	84	*	6	*	6	-	-	2	100
1959	*	*	*	3	2	84	*	9	*	4	-	-	2	100
1960	*	-	*	5	2	90	*	3	*	2	-	-	2	100
1961	*	*	*	4	2	96	-	-	*	*	-	-	2	100
1962	*	*	*	4	2	95	*	1	*	*	-	-	2	100
1963	-	-	*	3	3	96	-	-	*	*	-	-	3	100
1964	*	*	*	4	3	96	-	-	*	*	-	-	3	100
1965	*	-	*	4	3	95	-	-	*	1	-	-	3	100
1966	*	*	*	4	4	96	-	-	*	*	-	-	4	100
1967	*	*	*	4	4	93	-	-	*	2	-	-	4	100
1968	*	*	*	7	3	80	-	-	1	13	*	*	4	100
1969	*	*	*	7	4	72	*	6	1	15	*	*	6	100
1970	*	1	*	6	5	61	1	12	1	19	*	1	8	100
1971	*	*	*	6	4	56	1	15	1	14	1	8	7	100
1972	*	1	*	4	3	35	1	14	1	15	3	32	8	100
1973	*	*	*	4	3	28	1	8	1	12	5	48	10	100
1974	*	*	1	6	3	24	1	6	1	8	7	56	12	100
1975	*	*	1	6	5	38	*	3	1	8	6	45	13	100
1976	*	*	1	5	11	46	-	-	4	16	8	32	23	100
1977	*	2	1	4	12	44	-	-	5	18	9	33	27	100
1978	*	1	1	4	8	36	-	-	5	24	7	35	21	100
1979	1	3	1	3	6	32	-	-	5	23	7	37	20	100
1980	*	2	1	4	5	25	-	-	6	30	8	39	19	100
1981	*	1	1	3	10	41	-	-	6	26	7	29	23	100
1982	2	7	1	3	12	45	-	-	5	21	6	24	26	100
1983	2	8	1	4	10	40	-	-	3	12	8	32	25	100
1984	4	12	1	3	19	56	-	-	4	12	6	18	34	100
1985	6	15	3	8	18	46	-	-	5	13	7	18	39	100
1986	4	9	5	12	21	49	-	-	5	12	7	16	43	100
1987	3	11	1	4	16	57	-	-	4	14	4	14	28	100

Includes any unallocated value; - = zero; * = less than $500,000 or .5%. Rows may not add to Total because of rounding. Source: USDC, 1986 and unpub. prelim. NMFS data.

Table 38. EEZ and Total Surf Clam and Ocean Quahog Ex-Vessel Value (millions of $), 1974 - 1987

	Surf Clams					Ocean Quahogs				
	EEZ			Total		EEZ			Total	
	Value	% Change	% of Total	Value	% Change	Value	% Change	% of Total	Value	% Change
1974	10		83	12		-	-	-	*	*
1975	7	-30%	54	13	8%	-	-	-	*	*
1976	21	300%	91	23	77%	1	-	77%	2	552%
1977	24	14%	89	27	17%	5	500%	83%	6	300%
1978	18	-25%	86	21	-22%	6	20%	86%	7	17%
1979	17	-6%	85	20	-5%	9	50%	90%	10	43%
1980	18	6%	95	19	-5%	9	*	90%	10	*
1981	20	11%	87	23	21%	10	11%	98%	10	*
1982	21	5%	81	26	13%	10	*	98%	11	10%
1983	21	*	84	25	4%	10	*	95%	11	*
1984	27	29%	79	34	36%	11	10%	92%	12	9%
1985	29	7%	74	39	15%	16	45%	100%	16	33%
1986	32	10%	74	43	10%	13	-19%	81%	16	*
1987	23	-23%	82	28	-35%	14	8%	82%	17	6%

- = zero.
* = less than $500,000 or .5%.
Source: USDC, 1986 and unpub. prelim. NMFS data.

Table 39. Concentration of Surf Clam and Ocean Quahog Catch, 1979-87

	Surf Clams		Ocean Quahogs	
% Total Catch	# of Vessels	% of Vessels	# of Vessels	% of Vessels
10	4	3	2	2
20	9	6	4	4
30	16	11	7	6
40	24	16	9	8
50	34	22	13	11
60	47	31	17	15
70	61	40	23	20
80	79	52	30	26
90	101	66	41	36
100	152	100	114	100

Source: NMFS logbook reports.

Table 40. Revenues and Costs for Vessels Landing Both Surf Clams and Ocean Quahogs

Offshore Clam Price:	$8.01
Offshore Quahog Price:	$2.89

	Class 1	Class 2	Class 3
1987 Vessel Nos.	0 boats	15 boats	53 boats
Ave. Crew Size	3 men	4 men	5 men
REVENUE (Offshore Clam Trips)			
Number Clam Trips	-	21	18
Catch per Trip (bu)	-	808	1,274
Total Catch (bu)	-	16,968	22,932
Total Clam Rev. ($)	-	$135,914	$183,685
REVENUE (Quahog Trips)			
Number Quahog Trips	-	21	54
Catch per Trip (bu)	-	1,078	1,456
Total Catch (bu)	-	22,638	78,624
Total Quahog Rev. ($)	-	$65,424	$227,223
Total Revenue ($)	-	$201,338	$410,909
VARIABLE COSTS (Offshore Clam Trips)			
Fuel*	-	$5,200	$9,100
Labor	-	$44,852	$60,616
Food	-	$924	$990
Gear, Supplies, & Repairs	-	$14,400	$17,800
Total Clam Var. Costs	-	$65,376	$88,506
VARIABLE COSTS (Quahog Trips)			
Fuel*	-	$7,000	$28,600
Labor	-	$21,590	$74,984
Food	-	$924	$2,970
Gear,Supplies,Repairs	-	$20,600	$88,800
Total Qhg. Var. Costs	-	$50,114	$195,354
Total Variable Cost	-	$115,489	$283,860
FIXED COSTS			
Hull Insurance	-	$14,500	$34,500
P&I Insurance	-	$16,000	$20,000
Haulout & Annual Maintenance**	-	$19,800	$26,400
Administrative	-	$2,718	$3,674
Professional Fees	-	$5,000	$5,000
Wharfage	-	$2,400	$2,400
Misc. (Phone, Travel)	-	$3,000	$3,000
Interest	-	$13,100	$31,300
Depreciation	-	$8,800	$20,900
Total Fixed Costs	-	$85,318	$147,174
NET REVENUE	-	$530	$-20,125

* Fuel Costs are quoted AFTER $0.15 per gallon Federal rebate.
** Haulout & Annual Maintenance costs are prorated from a 1.5 year cycle.

Table 41. Revenues and Costs for Vessels Landing Only Surf Clams

Offshore Clam Price: $8.01

	Class 1	Class 2	Class 3
1987 Vessel Nos.	11 boats	39 boats	24 boats
Ave. Crew Size	3 men	4 men	5 men
REVENUE (Offshore Clam Trips)			
Number Offshore Trips	14	21	20
Catch per Trip (bu)	428	808	1,274
Total Catch (bu)	5,992	16,968	25,480
Total Revenue ($)	$47,996	$135,914	$204,095
VARIABLE COSTS (Offshore Clam Trips)			
Fuel*	$2,300	$5,200	$10,100
Labor	$15,839	$44,852	$67,351
Food	$462	$924	$1,100
Gear,Supplies, Repairs	$6,900	$14,400	$19,700
Total Variable Cost	$25,501	$65,376	$98,251
FIXED COSTS			
Hull Insurance	$7,100	$14,500	$34,500
P&I Insurance	$12,000	$16,000	$20,000
Haulout & Annual Maintenance**	$13,200	$19,800	$26,400
Administrative	$960	$2,718	$4,082
Professional Fees	$5,000	$5,000	$5,000
Wharfage	$2,400	$2,400	$2,400
Misc. (Phone, Travel)	$3,000	$3,000	$3,000
Interest	$6,400	$13,100	$31,300
Depreciation	$4,300	$8,800	$20,900
Total Fixed Costs	$54,360	$85,318	$147,582
NET REVENUE	$-31,865	$-14,780	$-41,738

* Fuel Costs are quoted AFTER $0.15 per gallon Federal rebate.
** Haulout & Annual Maintenance costs are prorated from a 1.5 year cycle.

Table 42. Number of Plants Processing Surf Clams and/or Ocean Quahogs by State

	Plants By State										Surf	Quahog	
Year	ME	MA	RI	NY	NJ	DE	MD	PA	VA	Total	Only	Only	Both
1976	1	6	4	3	15	3	6	2	8	48	45	2	1
1977	1	5	4	3	13	3	7	3	8	47	36	2	9
1978	1	5	3	3	14	3	6	3	11	49	34	3	12
1979	1	5	3	3	11	3	6	2	10	44	30	3	11
1980	1	5	3	3	10	3	5	2	10	42	21	8	13
1981	1	6	2	3	10	3	4	1	10	41	25	5	11
1982	1	3	2	3	10	3	5	1	11	39	23	4	12
1983	1	3	3	3	10	3	6	1	11	41	24	4	13
1984	1	2	3	3	10	3	6	1	10	39	21	3	15
1985	2	2	3	3	10	3	6	2	9	40	21	4	15
1986	4	5	4	4	9	3	6	2	9	46	27	6	13

Source: NMFS Processed Products Survey, December 1987.

Table 43. Total Surf Clam and Ocean Quahog Plant Output by Weight (thousand pounds) and Value (thousand dollars) and Ratio to Total Plant Revenues

	Surf Clams			Ocean Quahogs		
Year	Weight	Value	Ratio	Weight	Value	Ratio
1976	133501	121872	0.46	3526	2635	0.01
1977	125742	127679	0.46	17964	17668	0.06
1978	113134	122148	0.41	25841	24595	0.08
1979	125919	128505	0.41	35984	28877	0.09
1980	114668	126549	0.41	52602	47895	0.15
1981	127305	145701	0.45	48807	37883	0.12
1982	137480	164109	0.68	57256	45897	0.19
1983	144910	164535	0.67	58003	46507	0.19
1984	161225	174260	0.62	62065	50894	0.18
1985	154103	170556	0.64	69063	61543	0.23
1986	147189	160990	0.50	70773	63270	0.19

Source: NMFS Processed Products Survey, December 1987.

Table 44. Total Plant Combined Surf Clam and Ocean Quahog Output by Weight (thousand pounds) and Value (thousand dollars), Ratio to Total Plant Revenues, and Estimated Total Clam Related Employment

	Surf + Quahog		Total Plant	Clam	Clam
Year	Weight	Value	Revenue	Ratio	Employment
1976	137027	124508	265469	0.47	1744
1977	143705	145347	278074	0.52	1911
1978	138975	146743	301467	0.49	1867
1979	161903	157382	316592	0.50	1799
1980	167270	174444	311519	0.56	1762
1981	176112	183584	321621	0.57	2049
1982	194736	210006	241815	0.87	2808
1983	202913	211042	245331	0.86	2712
1984	223290	225154	278932	0.81	2996
1985	223166	232099	264545	0.88	3094
1986	217962	224260	325165	0.69	2536

Source: NMFS Processed Products Survey, December 1987.
Note: Figures for output and revenue include data for both intermediate and finished products so some double counting is present.

Table 45. Disposition of Clam Meats by Value of Product Type, 1986

	Percent of 1986 Total Processed Value	
Product Type	Surf Clam	Ocean Quahog
Fresh Shucked	21.9	33.8
Frozen Shucked	13.8	6.7
Chowders/soups	15.9	22.2
Canned Chopped	17.6	34.6
Breaded/battered	21.7	0.1
Sauces	6.7	-
Juices	1.6	2.7

Source: NMFS Processed Products Survey, December 1987.

Table 46. Output (000lbs) and Value (000$) of Clam Products, 1976-86

	Fresh Shucked Clams		Frozen Shucked Clams		Chowders, Soups, Stews		Breaded/Battered Clam Products	
Year	Pounds	Value	Pounds	Value	Pounds	Value	Pounds	Value
1976	40968	42676	9994	9527	47180	22309	732	1039
1977	36999	36908	14314	14415	51813	34320	713	1087
1978	46107	48180	4968	5154	47718	30435	16412	29054
1979	54484	49148	11417	10341	50787	32417	17217	28862
1980	53410	52946	8238	7619	54252	35352	21835	40556
1981	51306	51895	12811	12815	62661	39623	21726	41368
1982	61203	61722	9373	9836	60067	41990	23376	46351
1983	63623	65692	11022	11741	59382	39544	24228	42539
1984	70250	76227	21004	22358	53200	36163	21972	32819
1985	62256	59893	27329	30583	47805	36694	20391	33935
1986	58144	56600	23502	26453	56179	39620	23245	34933

	Canned Minced/ Chopped Clams		Clam Juices		Clams in White or Red Sauce	
Year	Pounds	Value	Pounds	Value	Pounds	Value
1976	7519	14356	7547	1456	4975	5433
1977	9741	23159	6787	2372	6778	6867
1978	9715	24818	8245	2727	4176	4389
1979	10663	24778	10048	2667	5269	5483
1980	10684	26664	11267	2868	7274	8184
1981	8799	27310	12534	3075	5825	6942
1982	15990	34906	16472	4925	8131	10203
1983	20960	38964	16941	3471	6513	8889
1984	22195	43834	20276	3720	14306	9980
1985	24969	53259	23236	4463	17095	13202
1986	20474	50183	23270	4324	12478	10807

Source: NMFS Processed Products Survey, December 1987.

Table 47. Cetaceans and Turtles Found in Survey Area

Scientific name	Common name	Est. Minimum Number in Study Area	Endan-gered	Threat-ened
LARGE WHALES				
Balaenoptera physalus	fin whale	1,102	X	
Megaptera novaeangliae	humpback whale	684	X	
Balaenoptera acutorostrata	minke whale	162		
Physeter catodon	sperm whale	300	X	
Eubalaena glacialis	right whale	29	X	
Balaenoptera borealis	sei whale	109	X	
Orcinus orca	killer whale	unk		
SMALL WHALES				
Tursiops truncatus	bottlenose dolphin	6,254		
Globicephala spp.	pilot whales	11,448		
Lagenorhynchus acutus	Atl. white-sided dolphin	24,287		
Phocoena phocoena	harbor porpoise	2,946		
Grampus griseus	grampus (Risso's) dolphin	10,220		
Delphinus delphis	saddleback dolphin	17,606		
Stenella spp.	spotted dolphin	22,376		
Stenella coeruleoalba	striped dolphin	unk		
Lagenorhynchus albirostris	white-beaked dolphin	unk		
Ziphius cavirostris	Cuvier's beaked dolphin	unk		
Stenella longirostris	spinner dolphin	unk		
Steno bredanensis	rough-toothed dolphin	unk		
Delphinapteras leucas	beluga	unk		
Mesoplodon spp.	beaked whales	unk		
TURTLES				
Caretta caretta	logggerhead turtle	4,017		X
Dermochelys coriacea	leatherback turtle	636	X	
Lepidochelys kempi	Kemp's ridley turtle	unk	X	
Chelonia mydas	green turtle	unk		X

Source: University of Rhode Island 1982.

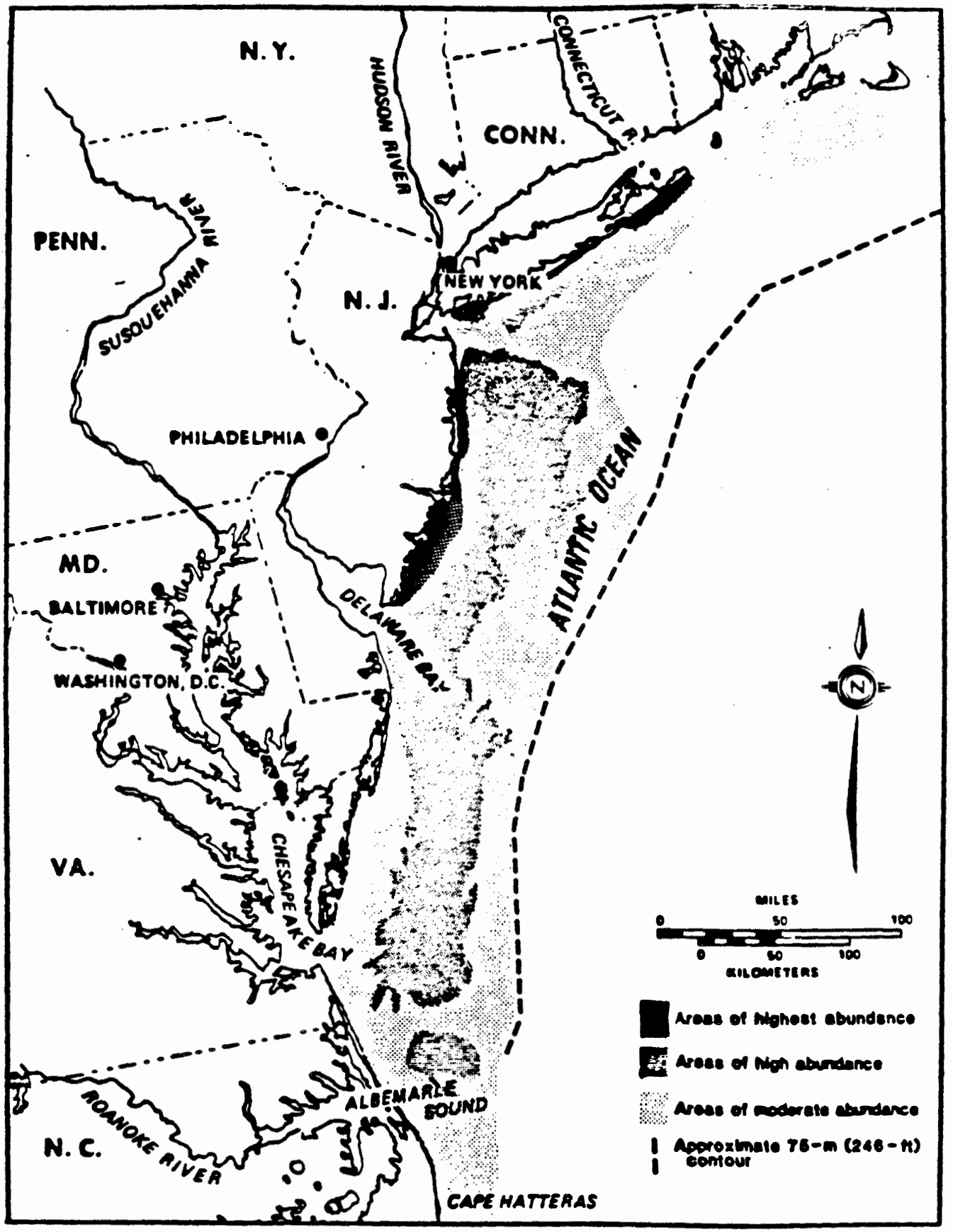


Figure 1. Mid-Atlantic distribution of the surf clam, with areas of relative abundance indicated.

Source: Fay et al., 1983

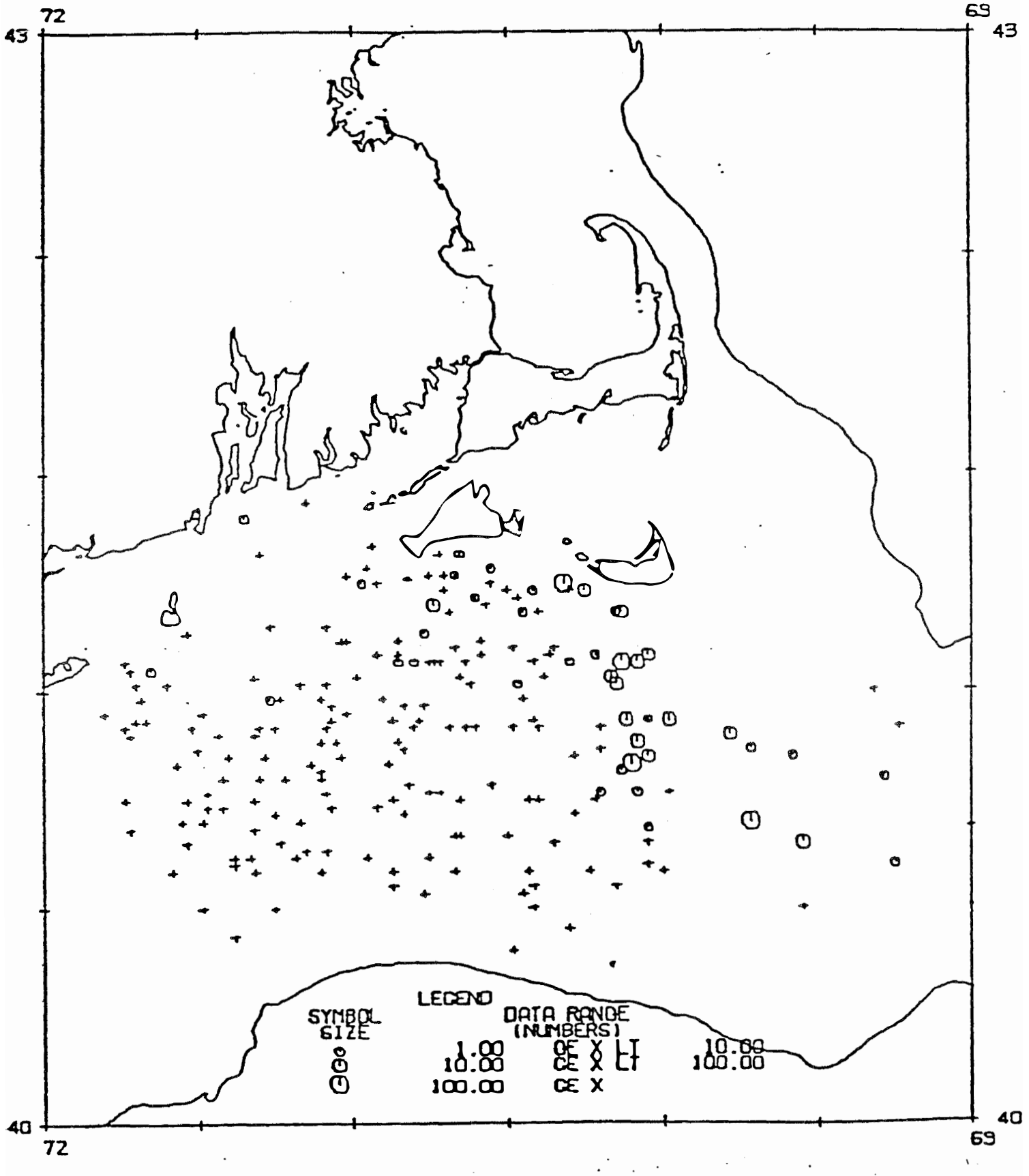
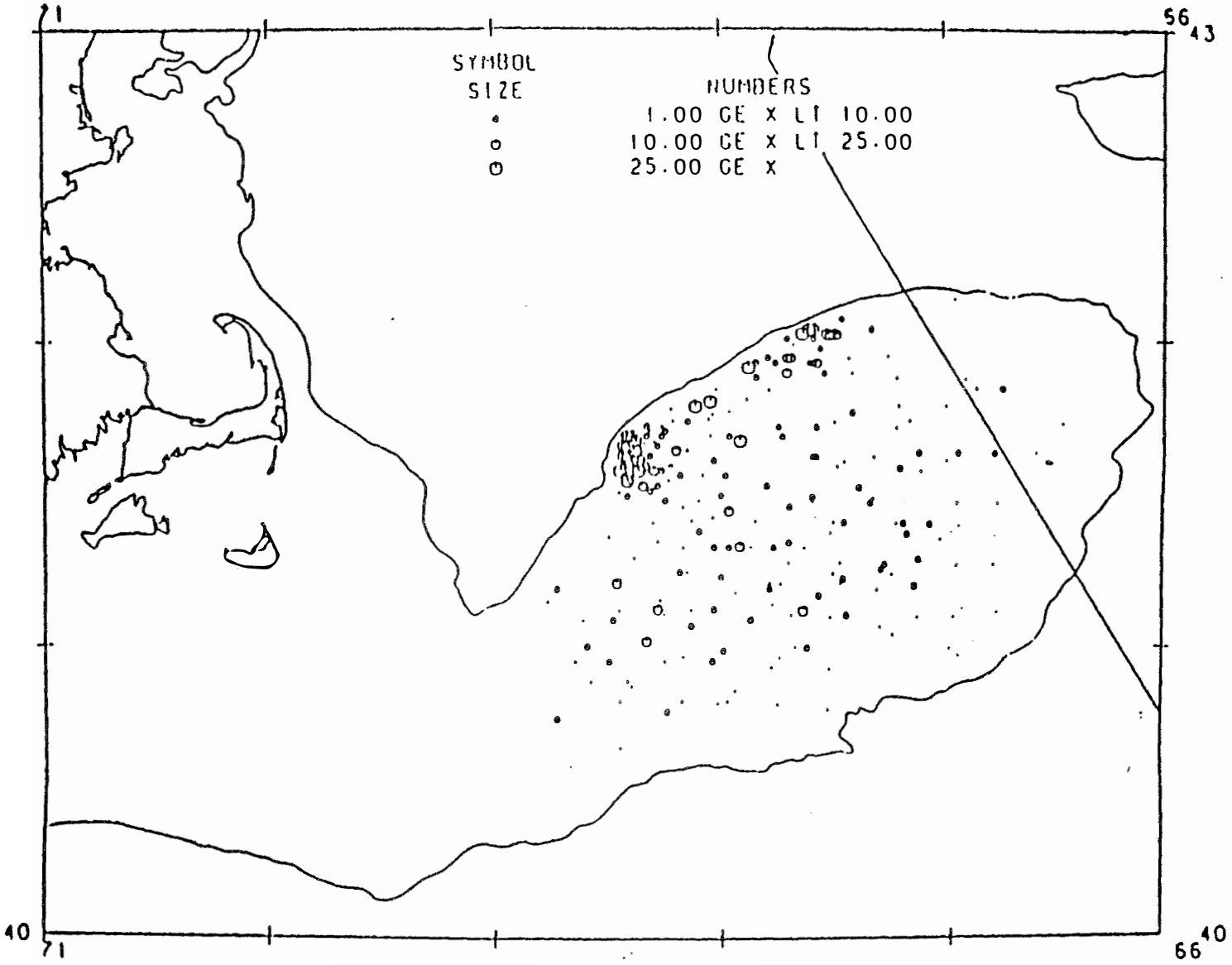


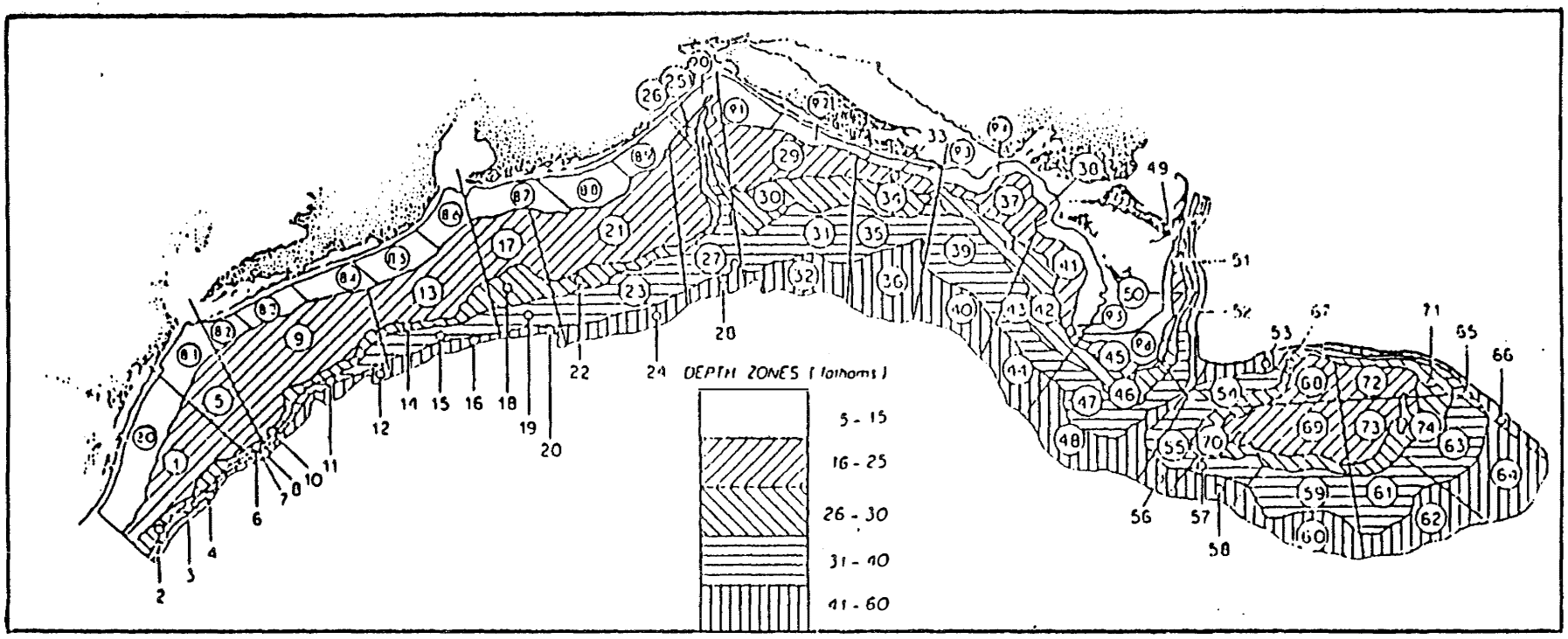
Figure 2. Distribution of surf clam catches during NEFC clam surveys of the Nantucket Area, mid-1970s through 1982. Source: Murawski and Serchuk, 1983a



SURF CLAM DISTRIBUTION ON GEORGES BANK
NMFS CLAM SURVEYS 1980-1984

Figure 3. Distribution of surf clam catches during NEFC clam surveys of Georges Bank, 1980-1984. Small closed dots indicate survey locations where no clams were caught. Open circles indicate survey catches in numbers of clams. Diagonal line indicates approximate U.S.-Canadian boundary in the Georges Bank region.

Source: Murawski and Serchuk, 1984b



Southern Va.-North Carolina

Stratum	Miles
1	1,163
2	175
3	126
4	117
5	453
6	62
7	46
8	74
80	767
81	360

Delmarva

Stratum	Miles
9	2,171
10	152
11	229
12	204
13	1,127
14	219
15	394
16	211
82	180
83	241
84	417
85	382
86	203

New Jersey

Stratum	Miles
17	749
18	249
19	274
20	120
21	1,650
22	312
23	714
24	476
25	648
26	188
27	451
28	149
87	479
88	578
89	382
90	182

Long Island

Stratum	Miles
29	1,096
30	669
31	932
32	627
33	363
34	203
35	601
36	694
91	340
92	191
93	83

Southern New England

Stratum	Miles
37	672
38	220
39	967
40	573
41	602
42	343
43	432
44	383
45	392
46	416
47	871
48	1,109
49	244
50	150
51	139
52	307
94	229
95	446
96	495

Georges Bank

Stratum	Miles
53	266
54	278
55	364
56	209
57	184
58	300
59	539
60	810
61	576
62	701
63	694
64	988
65	164
66	266
67	210
68	370
69	938
70	520
71	146
72	504
73	501
74	433

Figure 4. Ocean quahog and surf clam survey strata off the northeast United States. Survey strata comprising each of six assessment areas are listed, along with the area (square nautical miles) of each.
Source: Murawski and Serchuk, 1984b

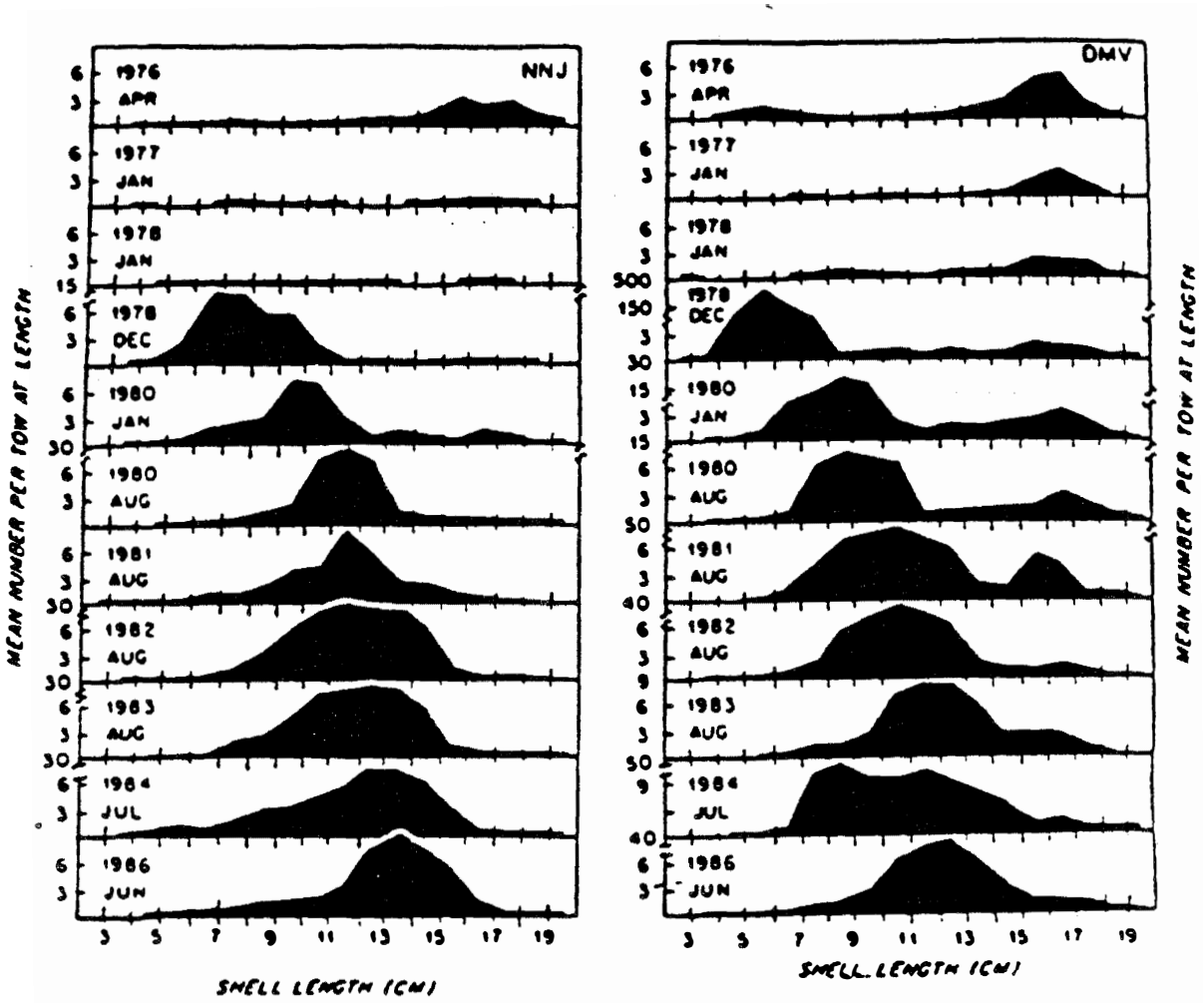


Figure 5. Abundance at length of surf clam populations off Northern New Jersey and Delmarva, 1976-1986. Data are stratified mean numbers per standardized survey tow in NEFC ocean shellfish surveys.

Source: USDC, 1987a

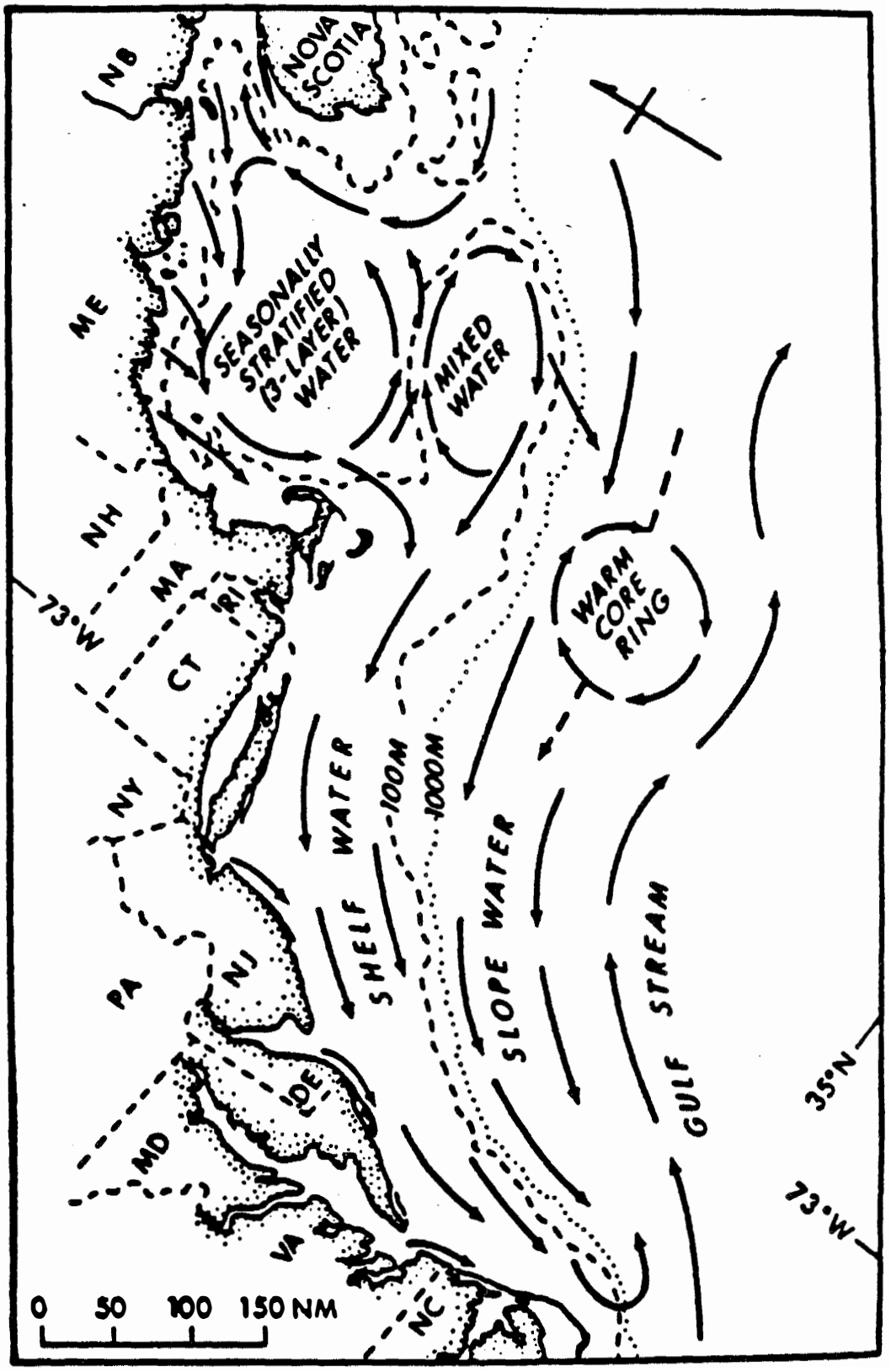


Figure 6. General surface layer circulation of northwestern Atlantic coastal and offshore waters.

Source: Smolowitz, 1988

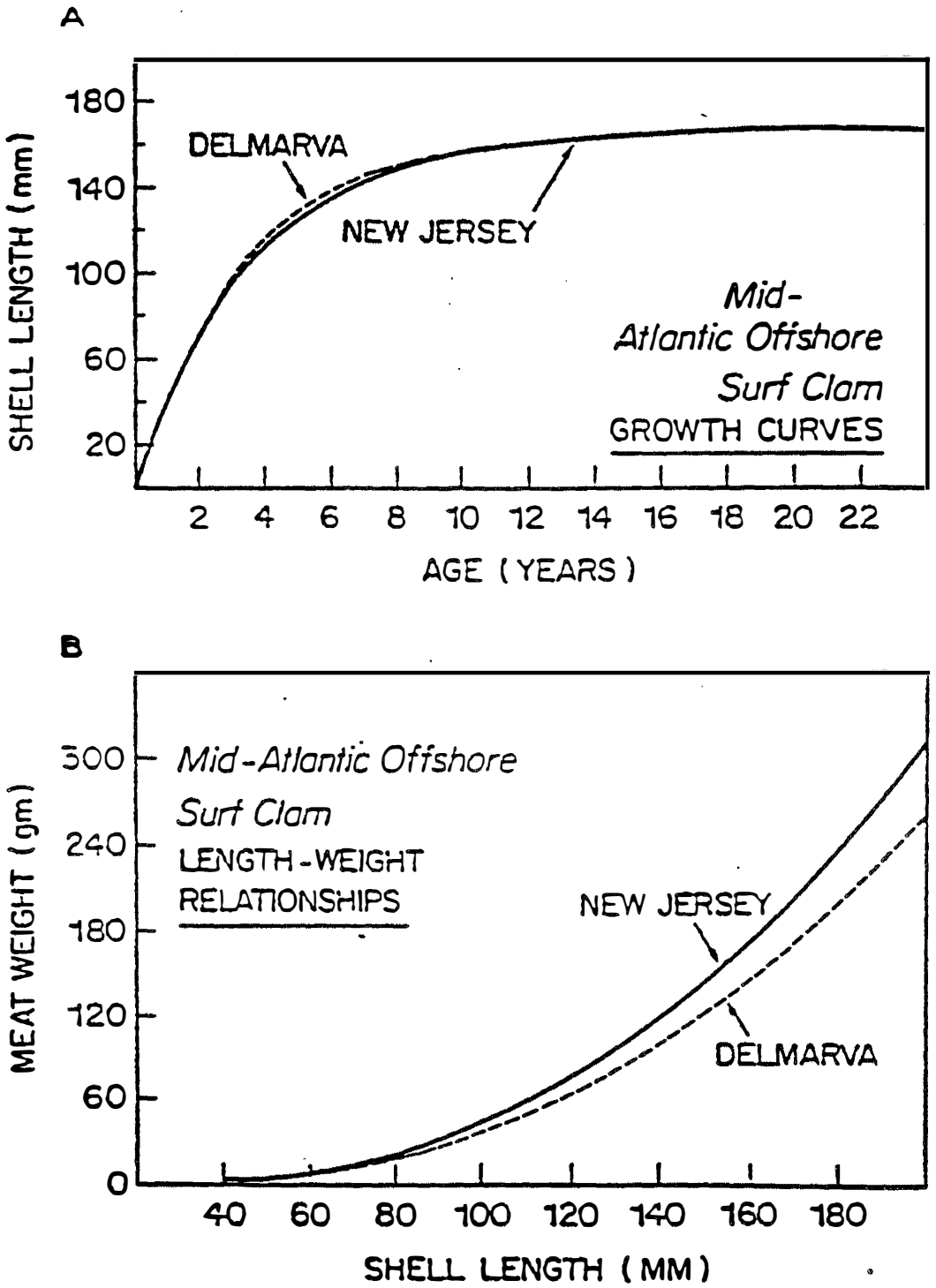


Figure 7. Growth curves (A) and length-weight relationships (B) for surf clams from offshore New Jersey and Delmarva derived from research vessel survey data. Source: Murawski and Serchuk, 1981

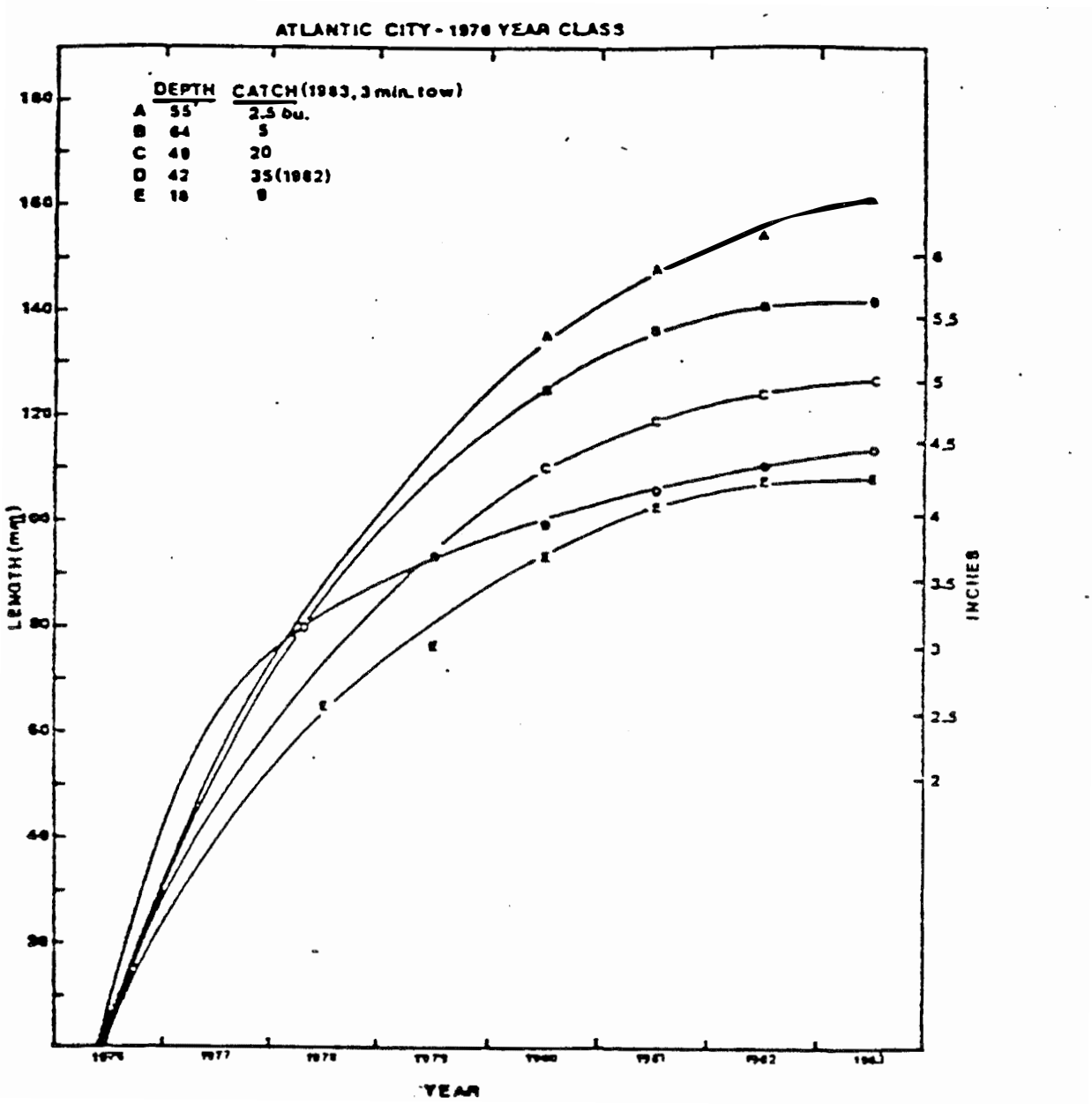


Figure 8. Growth curves for various densities of surf clams from the 1976 year class in the Atlantic City closed area Source: Haskin, 1984, pers. comm.

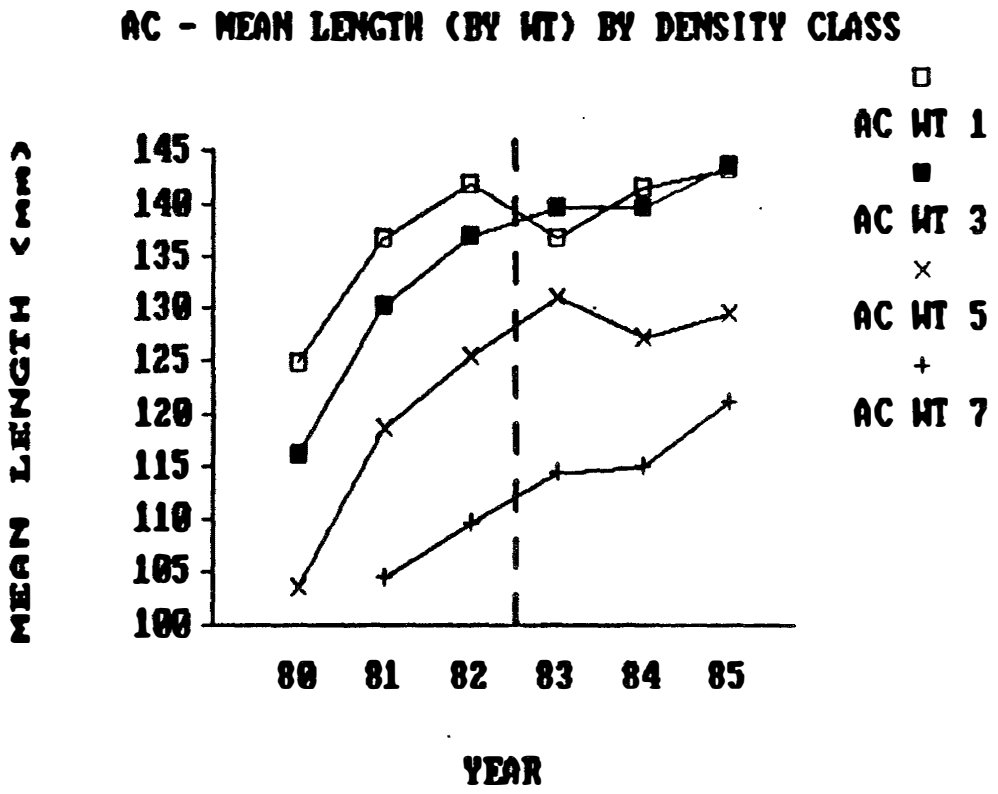


Figure 9A Annual Mean Length (mm) of Surf Clams Sampled from the Atlantic City Closed Area for Selected Density Categories, 1980-1985.
Source: Data from Rutgers Shellfish Lab. Survey

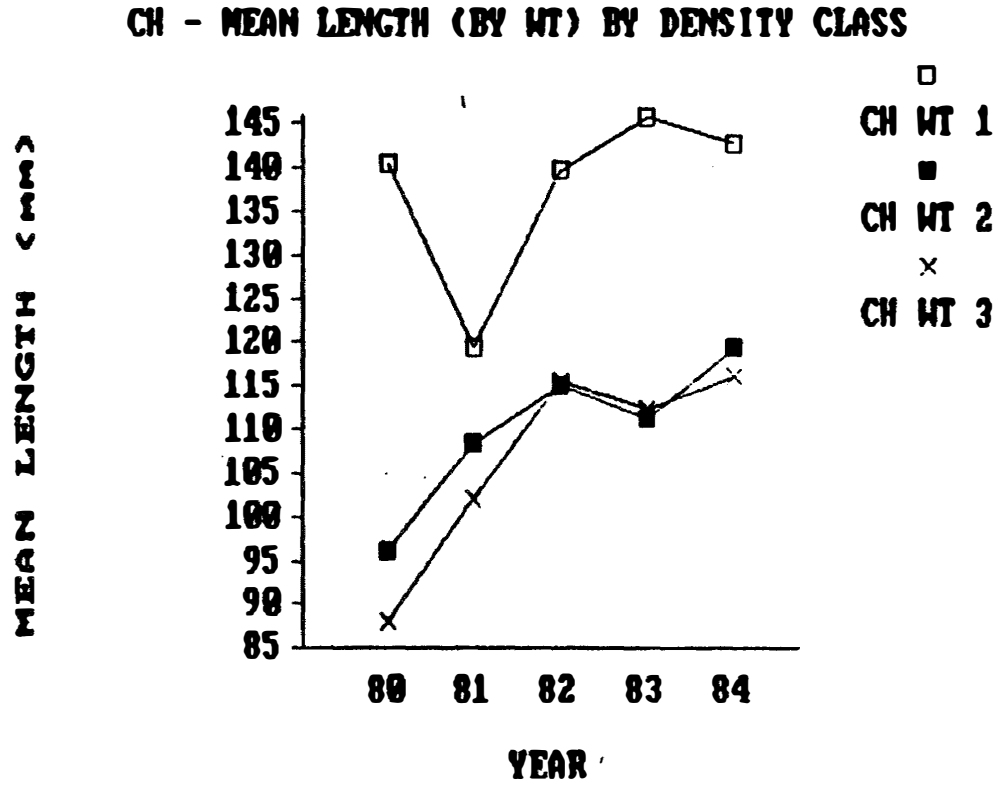


Figure 9B Annual Mean Length (mm) of Surf Clams Selected from the Chincoteague Closed Area for All Three Density Categories, 1980-1984.
Source: Data from Rutgers Shellfish Lab. Survey

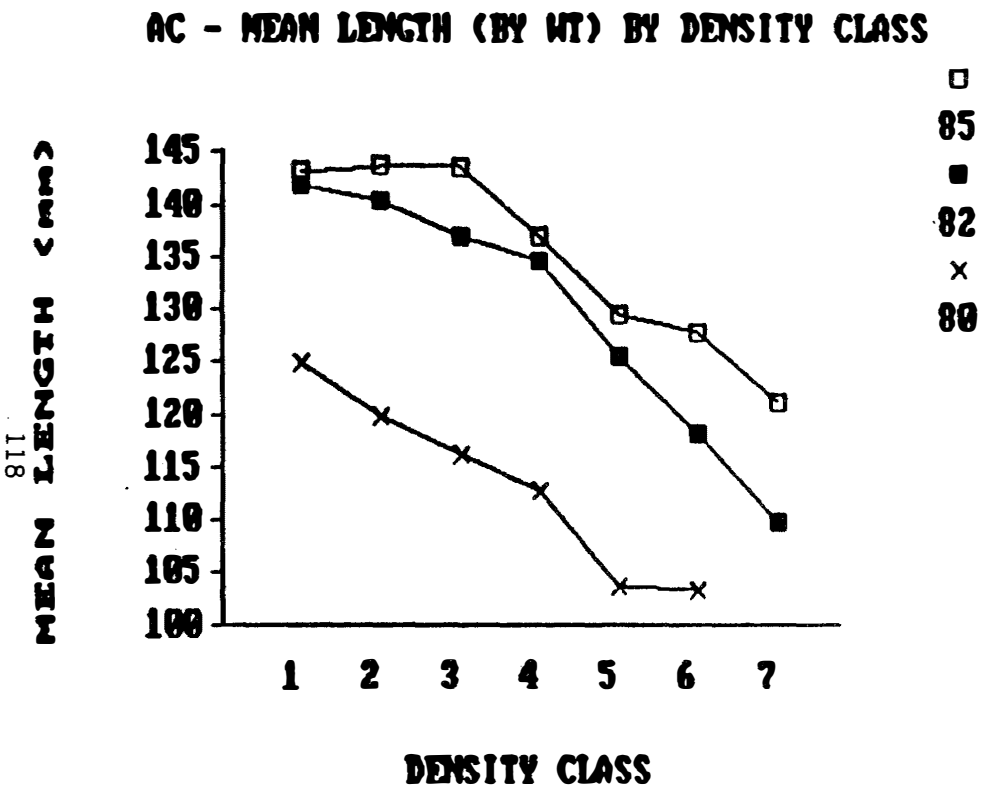


Figure 10A Mean Length (mm) of Surf Clams Sampled from the Atlantic City Closed Area for the 7 Defined Densities, 1980, 1982 and 1985. Source: Data from Rutgers Shellfish Lab. Survey

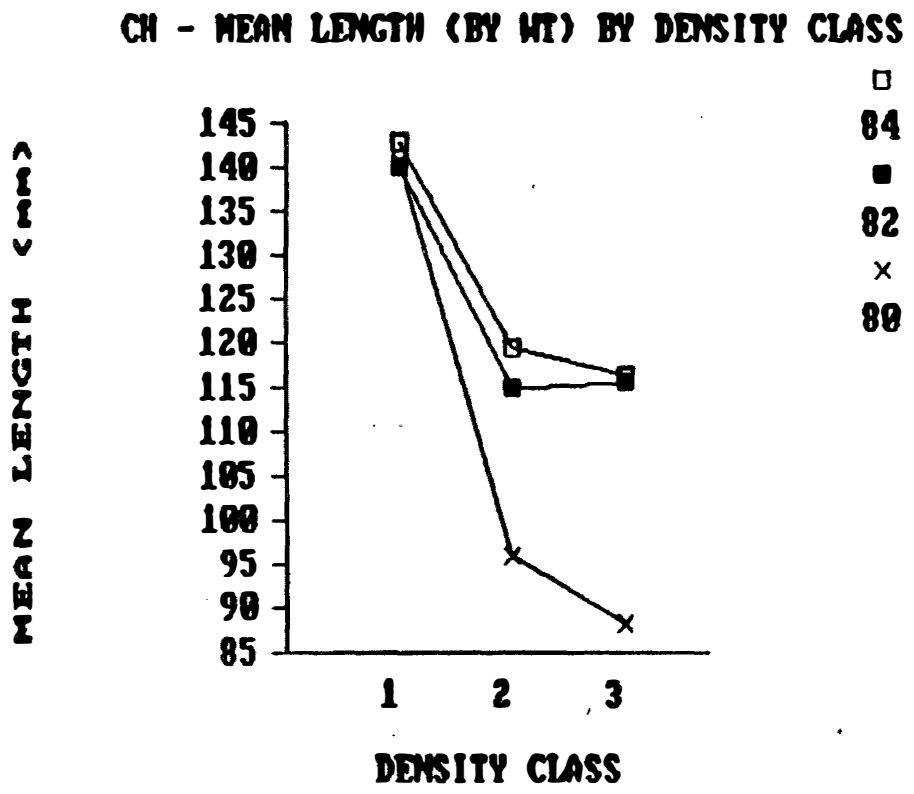


Figure 10B Mean Length (mm) of Surf Clams Sampled from the Chincoteague Closed Area for the 3 Defined Densities, 1980, 1982 and 1984. Source: Data from Rutgers Shellfish Lab. Survey

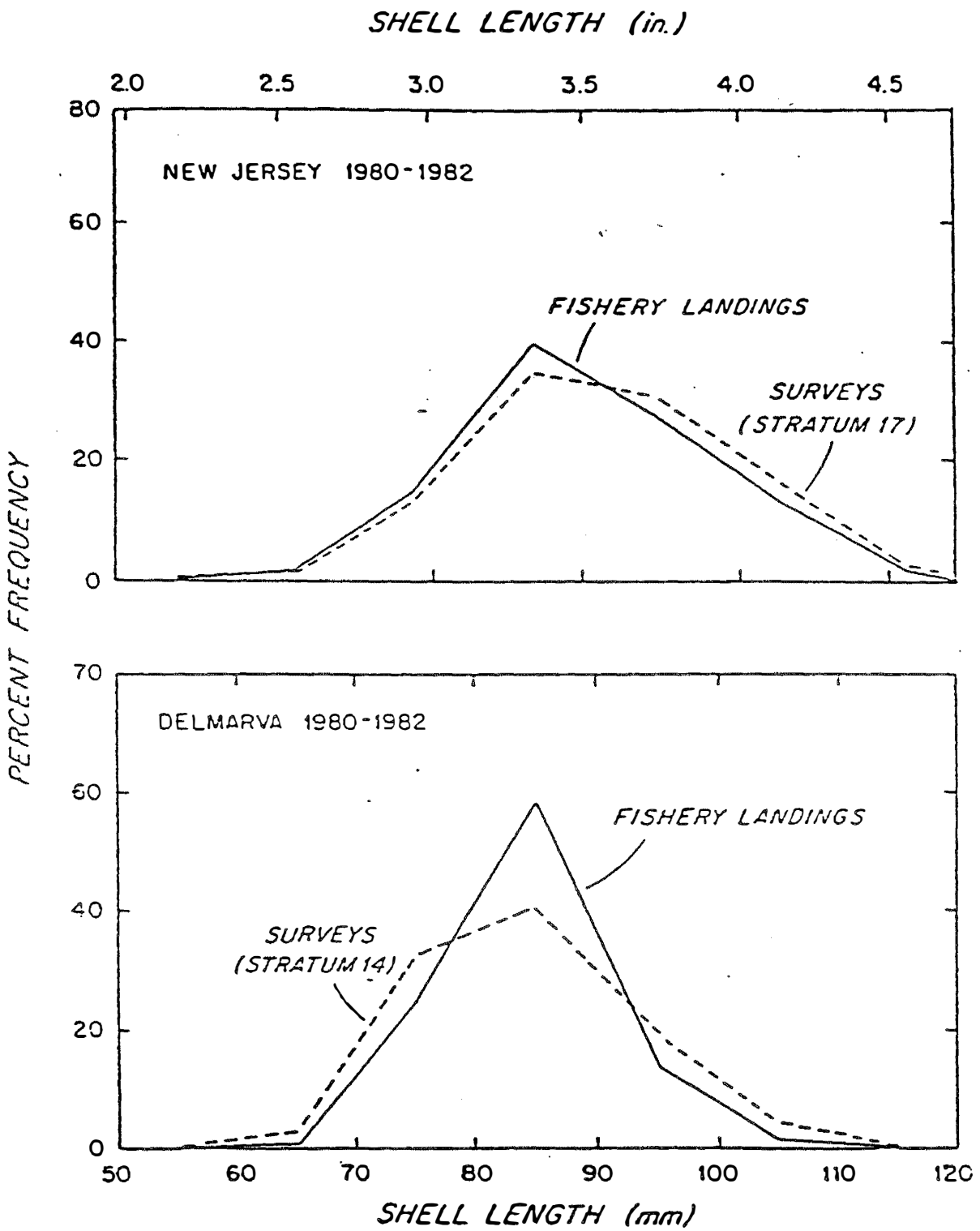


Figure 11. Shell length frequency distributions of ocean quahogs sampled from commercial catches and NMFS dredging surveys, 1980-1982. Data are presented for two FCZ fishing areas, off New Jersey and the Delmarva Peninsula. Source: Murawski and Serchuk, 1983b

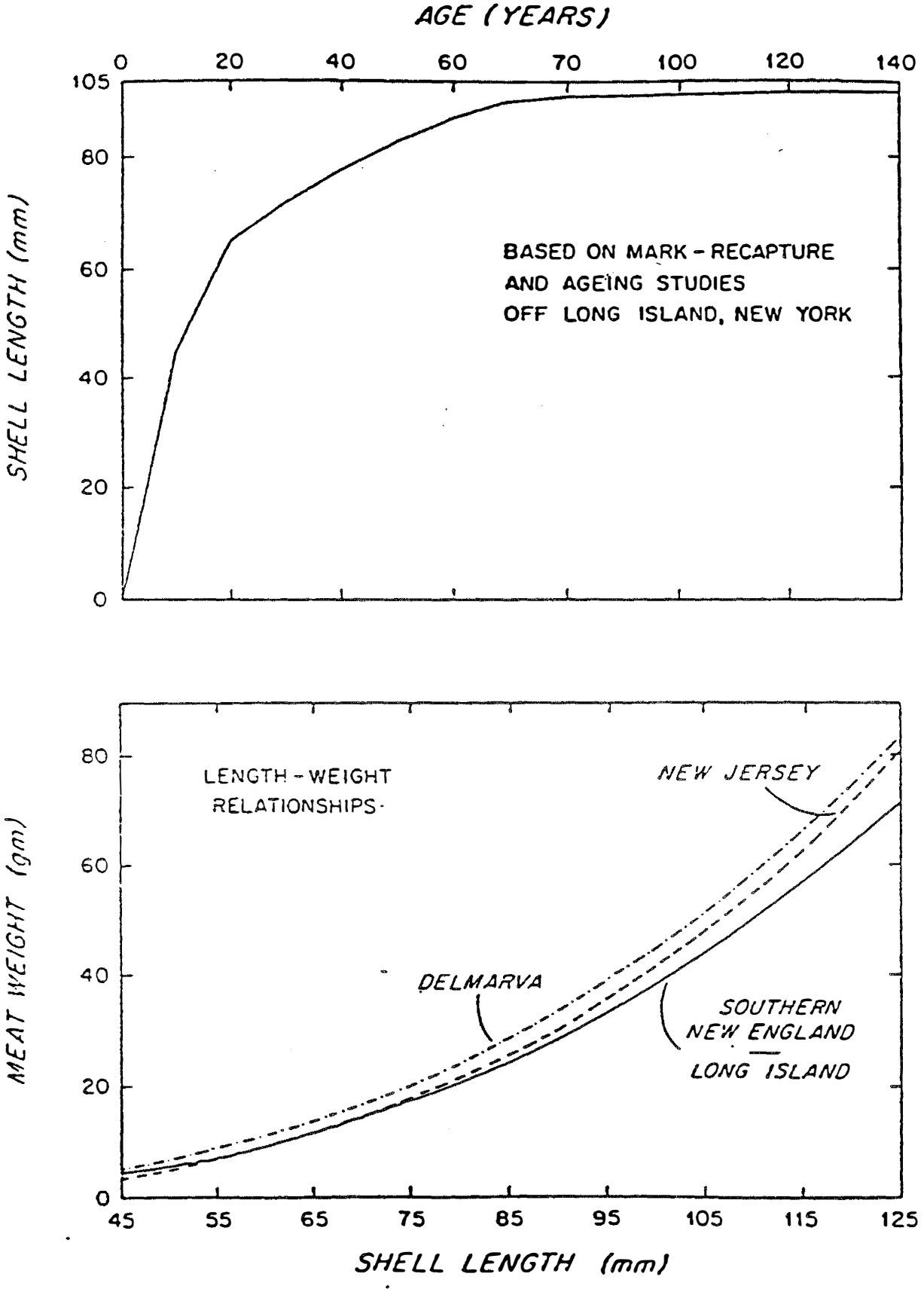


Figure 12. Age and growth relationships for ocean quahogs from the Middle Atlantic FCZ. The top panel illustrates the relation between shell length (mm) and age, the bottom panel gives the length-drained meat weight (grams) relations for three different assessment areas. Source: Murawski and Serchuk, 1983b

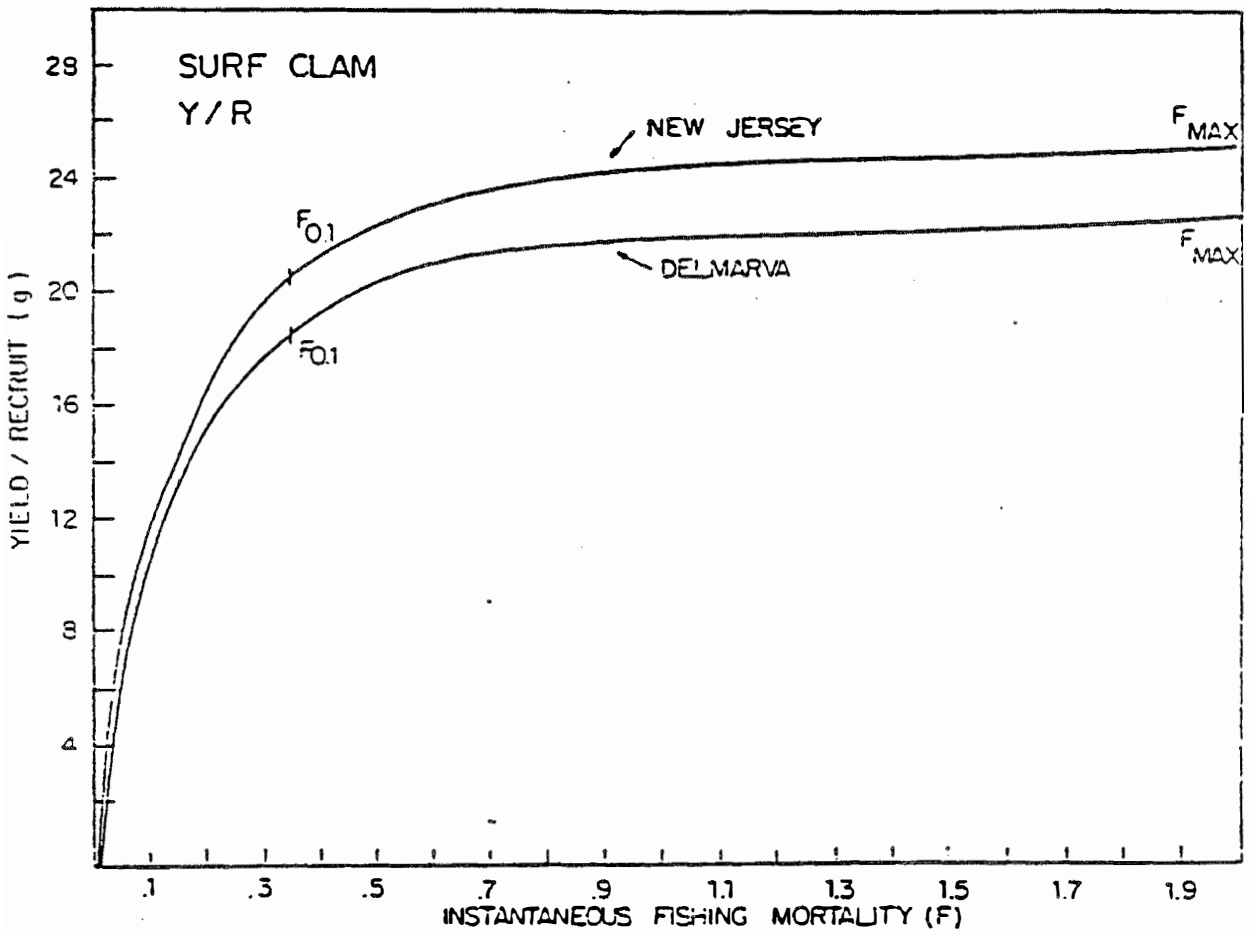


Figure 13. Yield per recruit curves for surf clams from offshore New Jersey and Delmarva. Source: Serchuk and Murawski, 1980

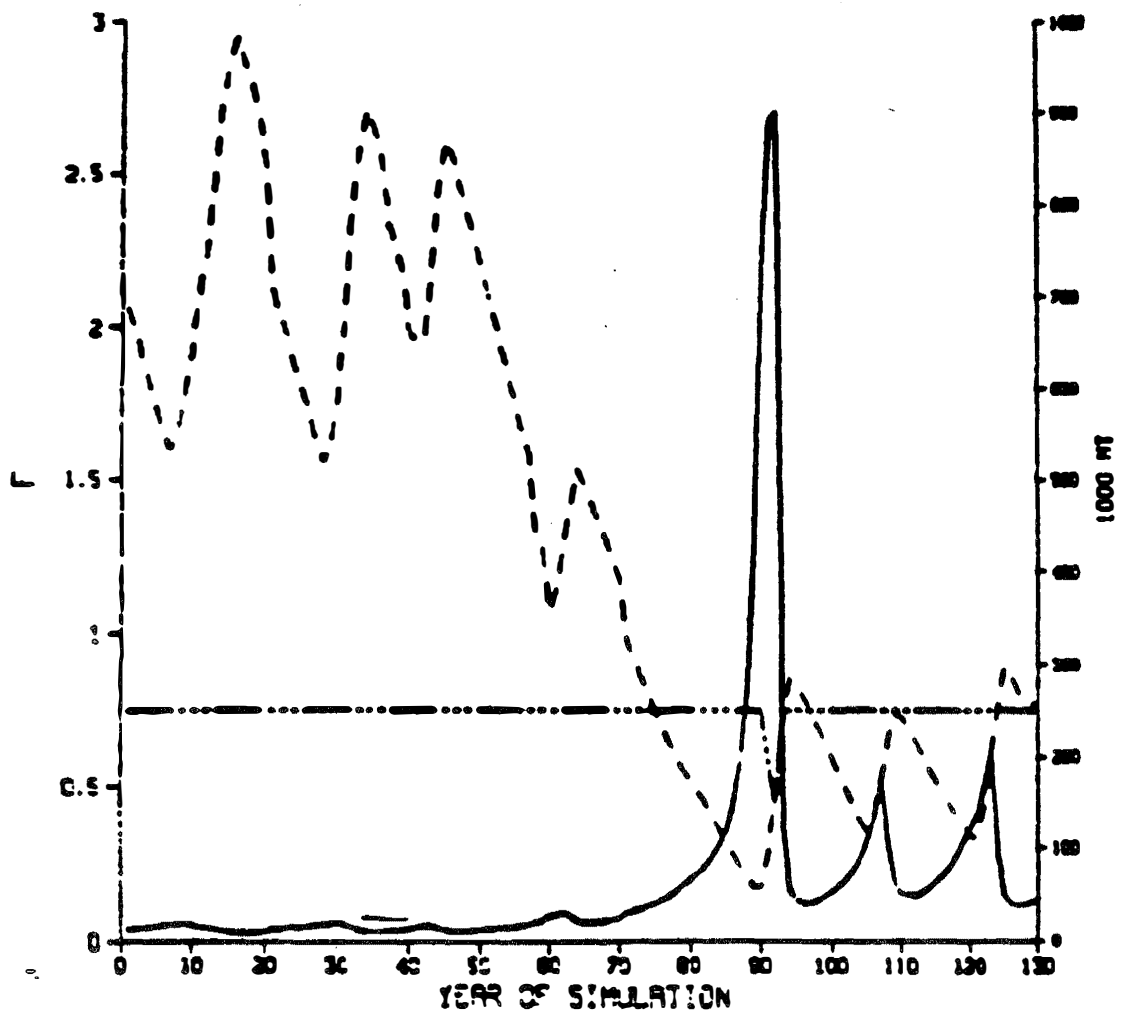


Figure 14. Simulated trends in Mid-Atlantic surf clam F (solid), stock size, (dashed) and catch (3-dashed) for a constant catch of 55 million lbs.

Source: USDC, 1987a

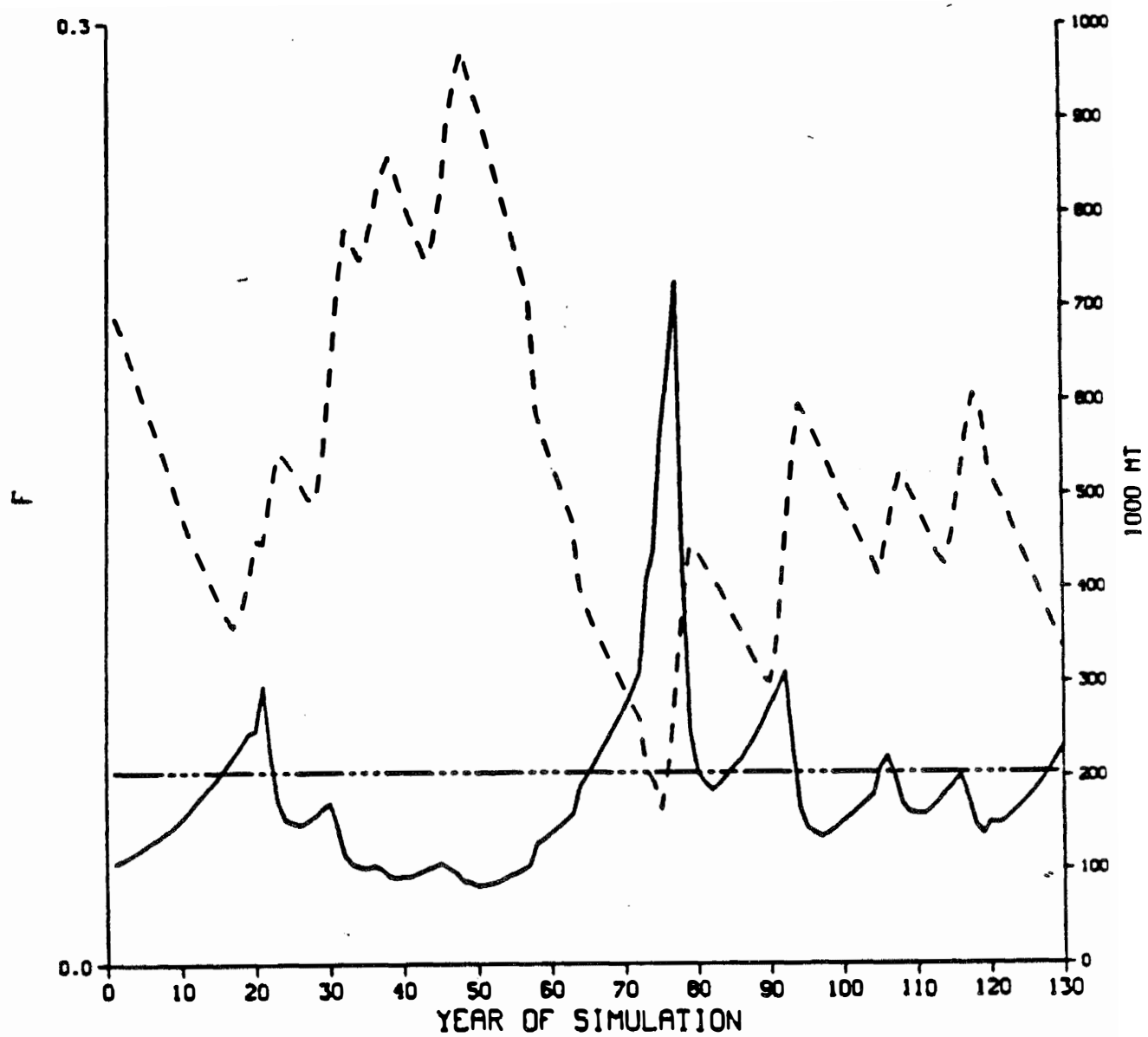


Figure 15. Simulated trends in Mid-Atlantic surf clam F (solid), stock size, (dashed) and catch (3-dashed) for a constant catch of 45 million lbs.

Source: USDC, 1987a

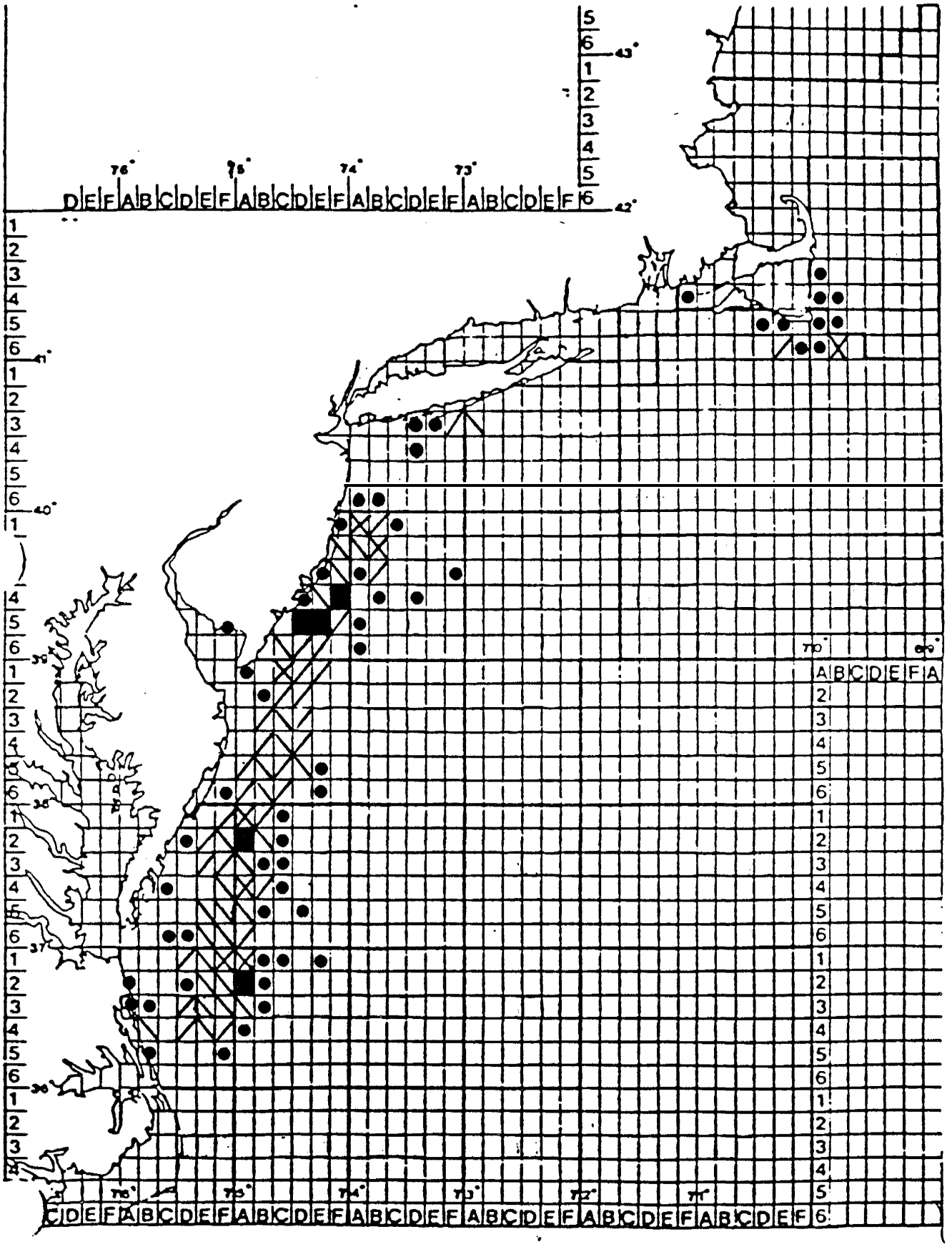


Figure 16. Bushels of Surf Clams Extracted from Individual Ten Minute Squares, 1983. Source: NMFS NER logbook data.

● = confidential
/ = less than 10,000 bushels
\ = 10,000 to 50,000 bushels
X = 50,000 to 100,000 bushels
■ = greater than 100,000 bushels

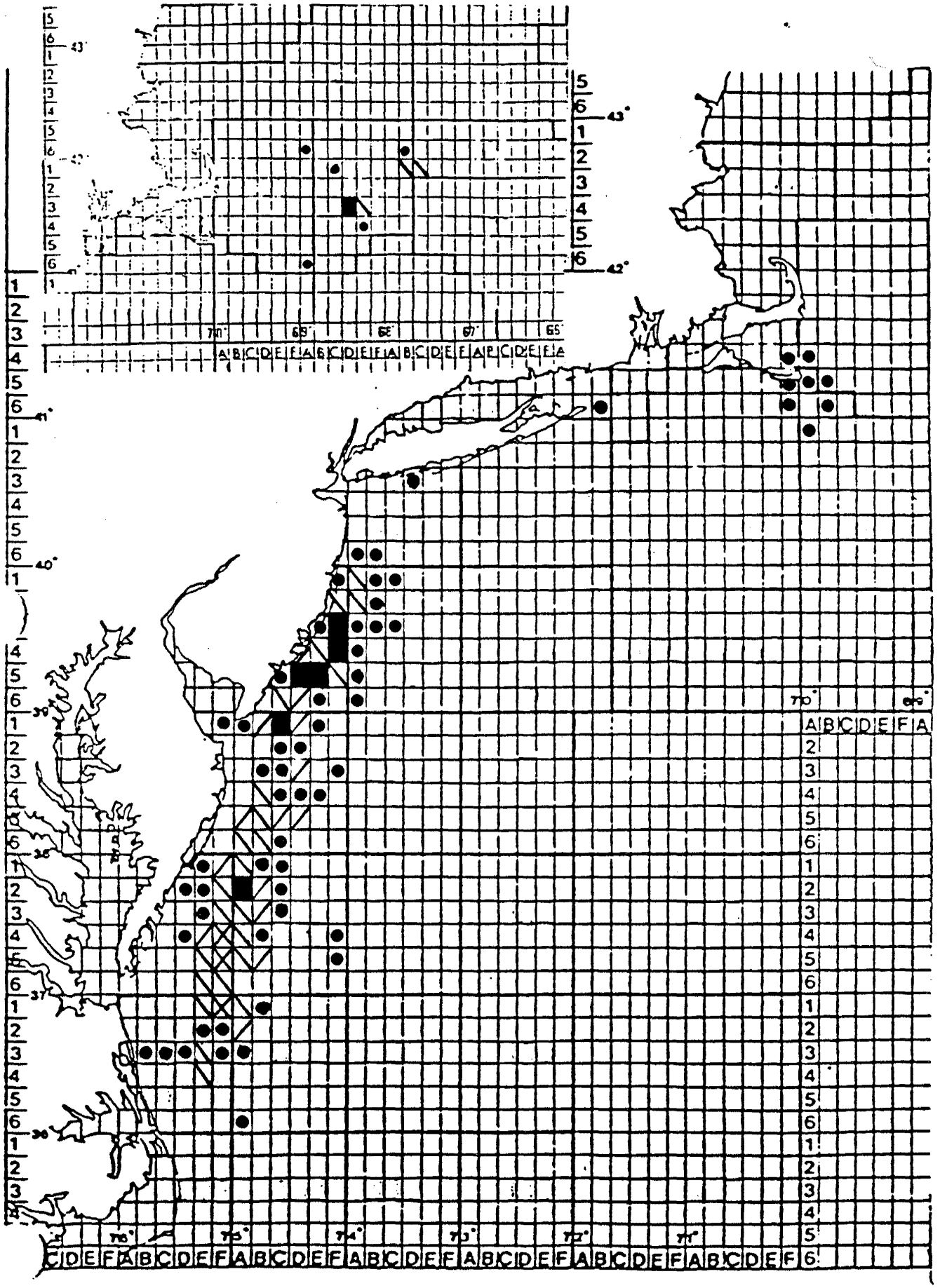


Figure 17. Bushels of Surf Clams Extracted from Individual Ten Minute Squares, 1984. Source: NMFS NER logbook data.

● = confidential
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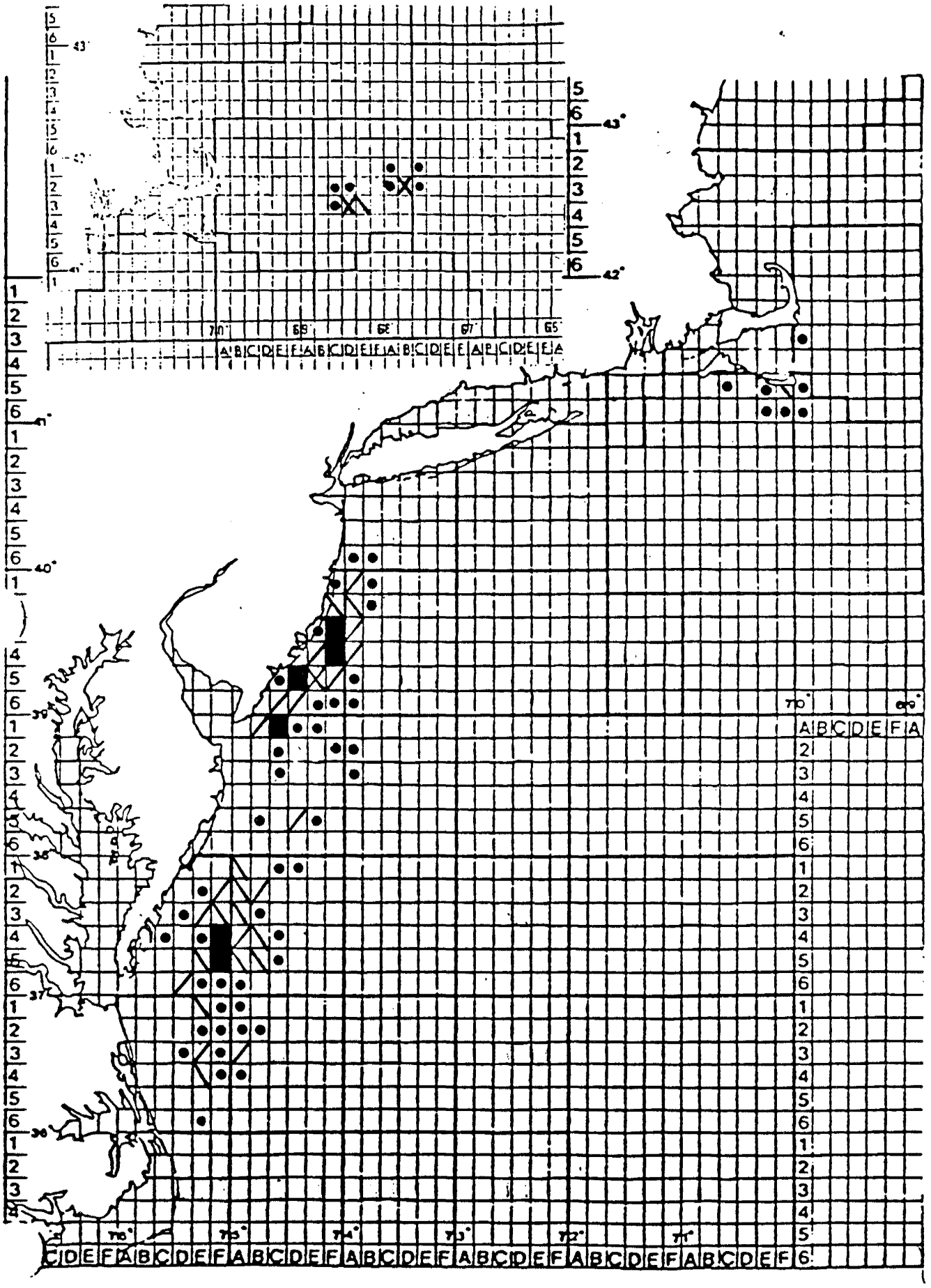

Figure 18. Bushels of Surf Clams Extracted from Individual Ten Minute Squares, 1985. Source: NMFS NER logbook data.

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/ = less than 10,000 bushels
\ = 10,000 to 50,000 bushels
X = 50,000 to 100,000 bushels
■ = greater than 100,000 bushels

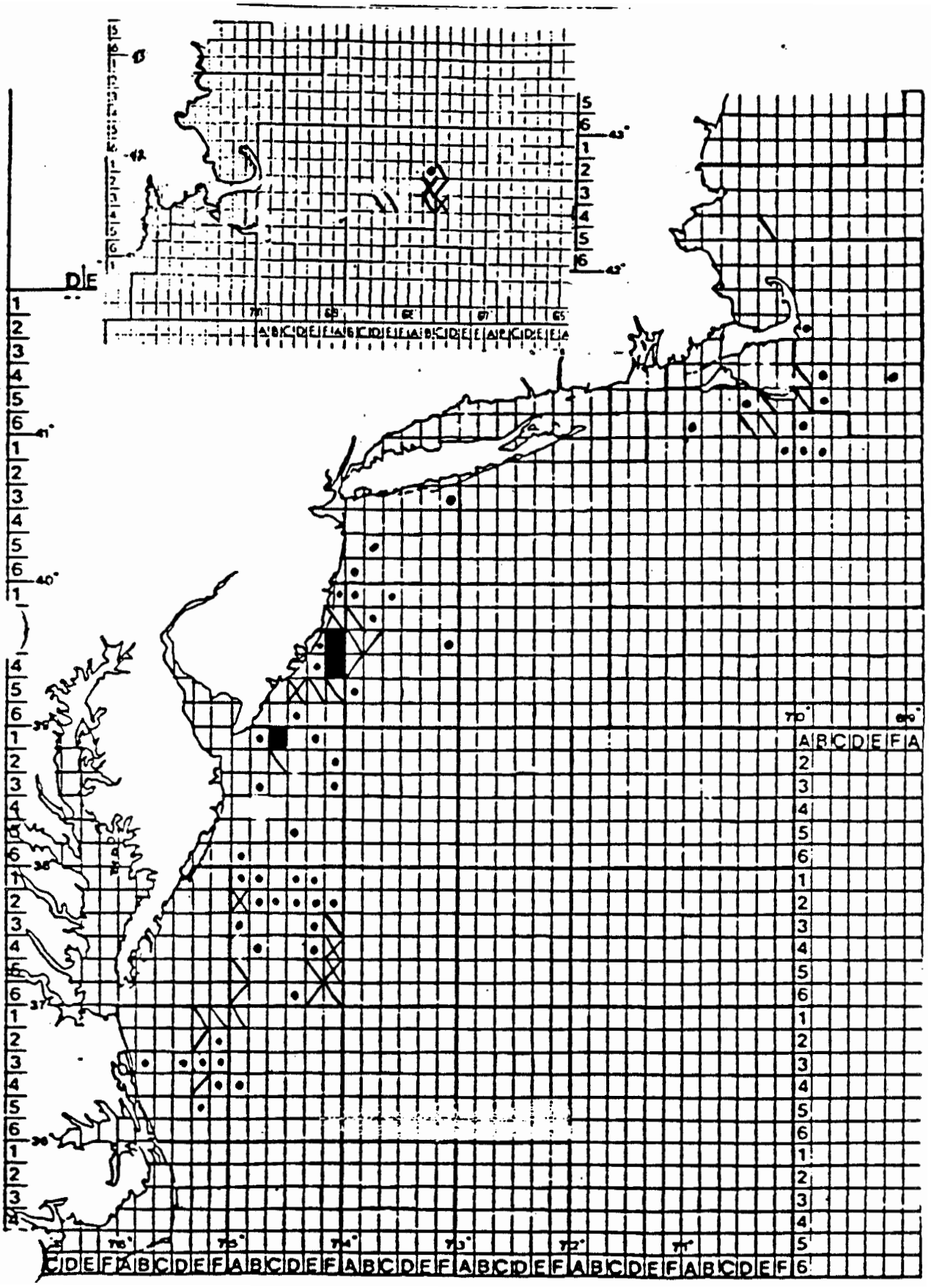

Figure 19. Bushels of Surf Clams Extracted from Individual Ten Minute Squares, 1986. Source: NMFS NER logbook data

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/ = less than 10,000 bushels
\ = 10,000 to 50,000 bushels
X = 50,000 to 100,000 bushels
■ = greater than 100,000 bushels

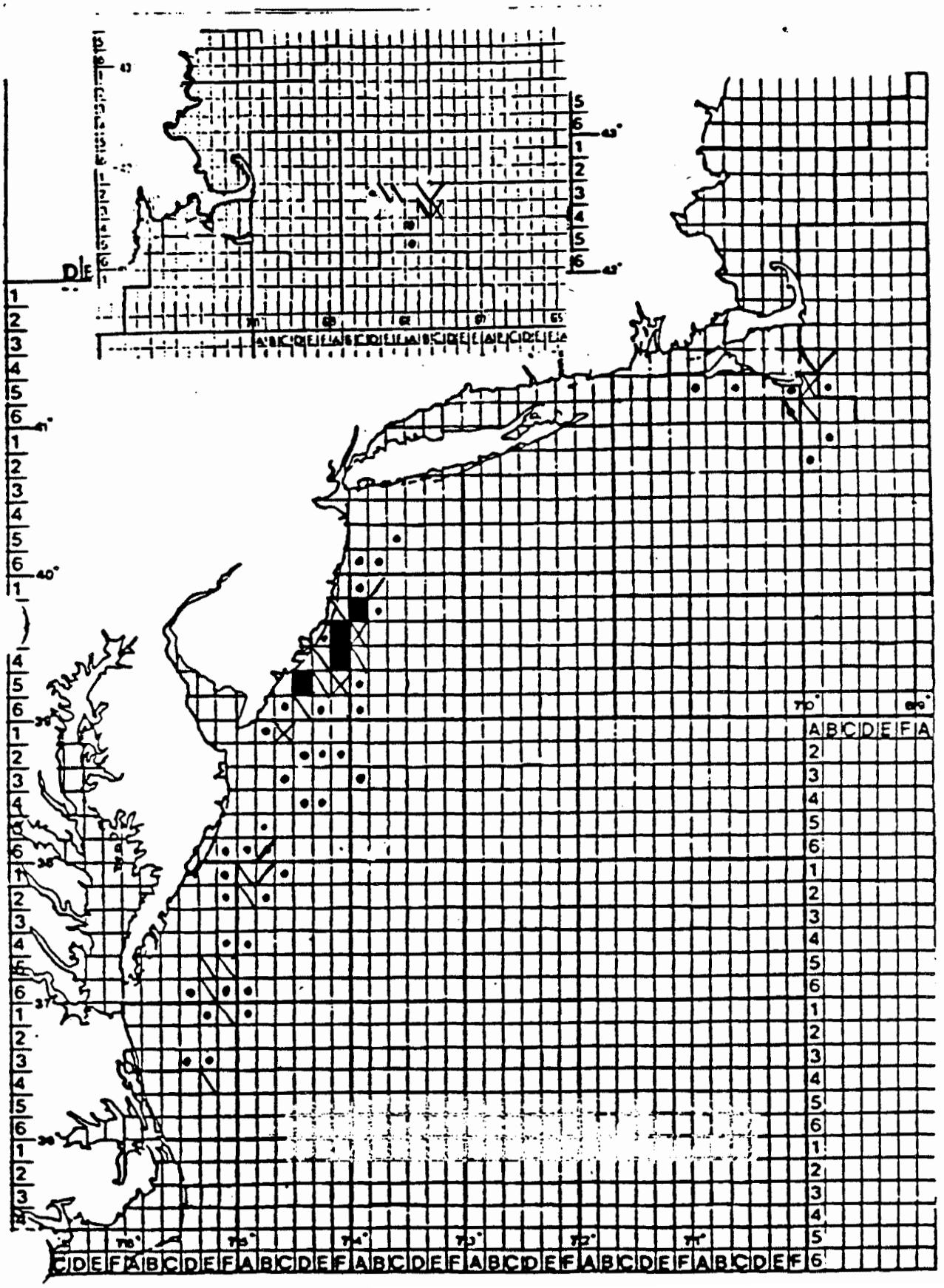

Figure 20. Bushels of Surf Clams Extracted from Individual Ten Minute Squares, 1987. Source: NMFS NER logbook data.

● = confindential
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\ = 10,000 to 50,000 bushels
X = 50,000 to 100,000 bushels
■ = greater than 100,000 bushels

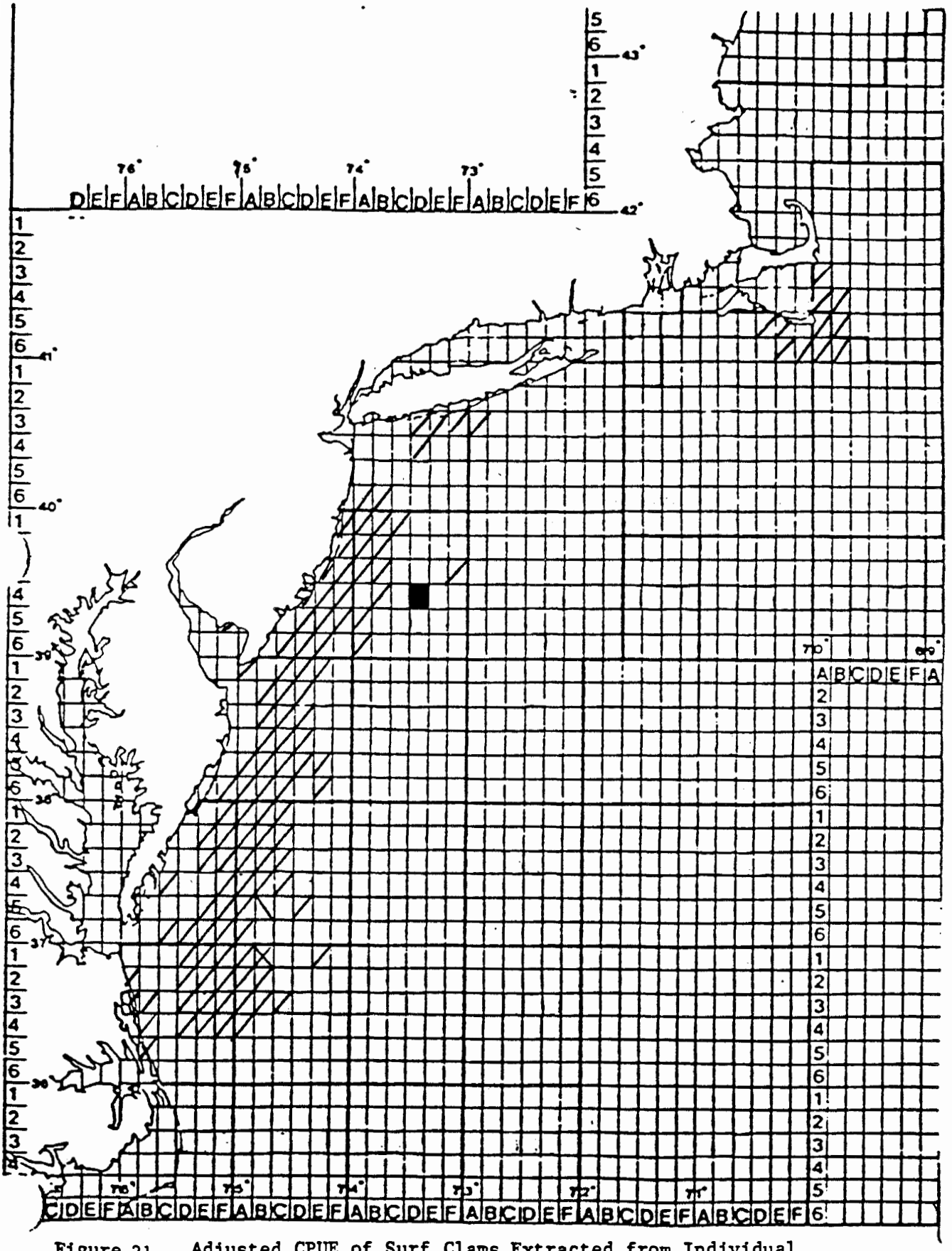

Figure 21. Adjusted CPUE of Surf Clams Extracted from Individual Ten Minute Squares, 1983. Source: NMFS NER logbook data.

/ = less than 200 bushels/hour
\ = 200 to 350 bushels/hour
X = 350 to 500 bushels/hour
■ = greater than 500 bushels/hour

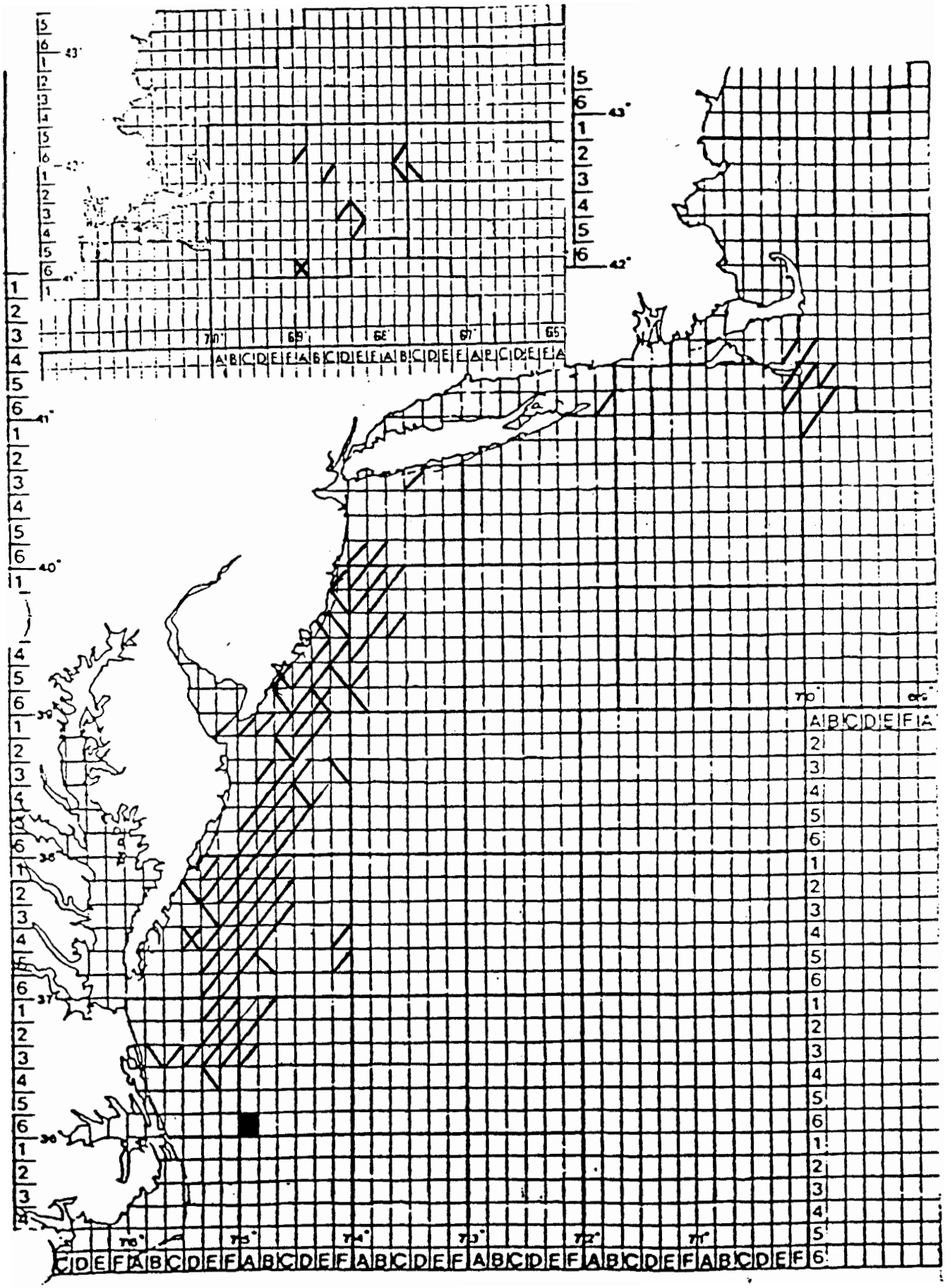

Figure 22. Adjusted CPUE of Surf Clams Extracted from Individual Ten Minute Squares, 1984. Source: NMFS NER logbook data.

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X = 350 to 500 bushels/hour
■ = greater than 500 bushels/hour

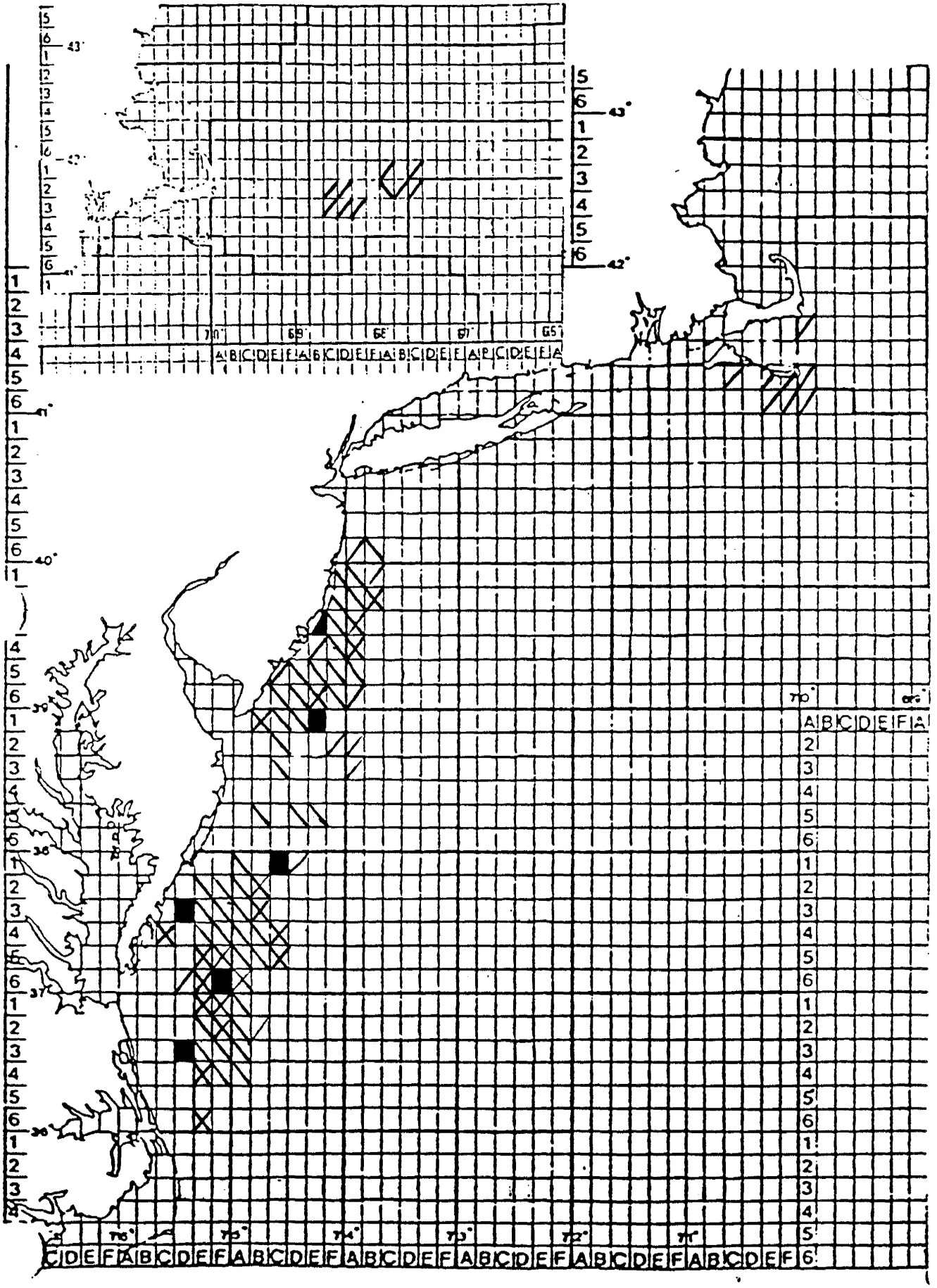

Figure 23. Adjusted CPUE of Surf Clams Extracted from Individual Ten Minute Squares, 1985. Source: NMFS NER logbook data.

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X = 350 to 500 bushels/hour
■ = greater than 500 bushels/hour

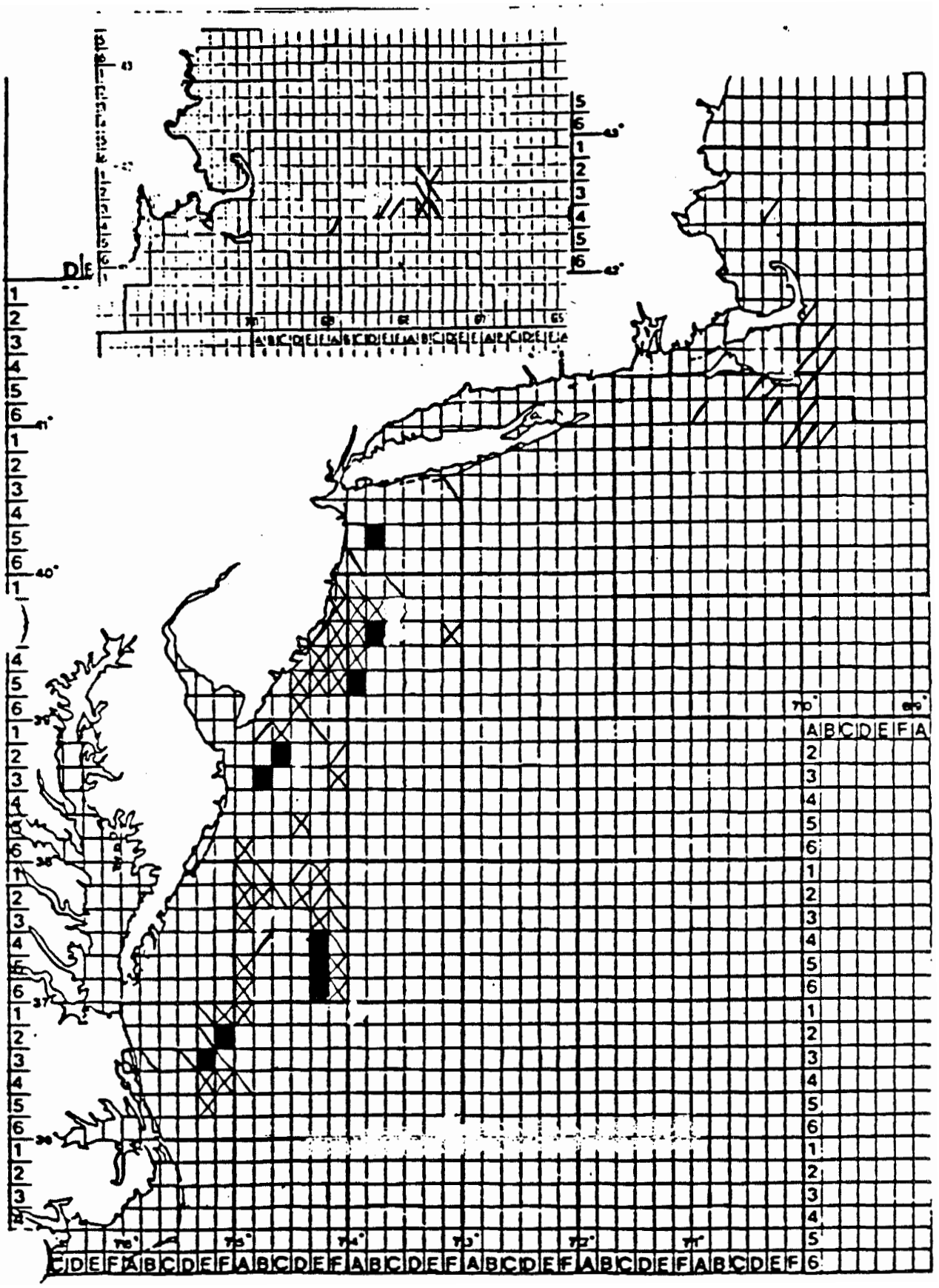

Figure 24. Adjusted CPUE of Surf Clams Extracted from Individual Ten Minute Squares, 1986. Source: NMFS NER logbook data.

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X = 350 to 500 bushels/hour
■ = greater than 500 bushels/hour

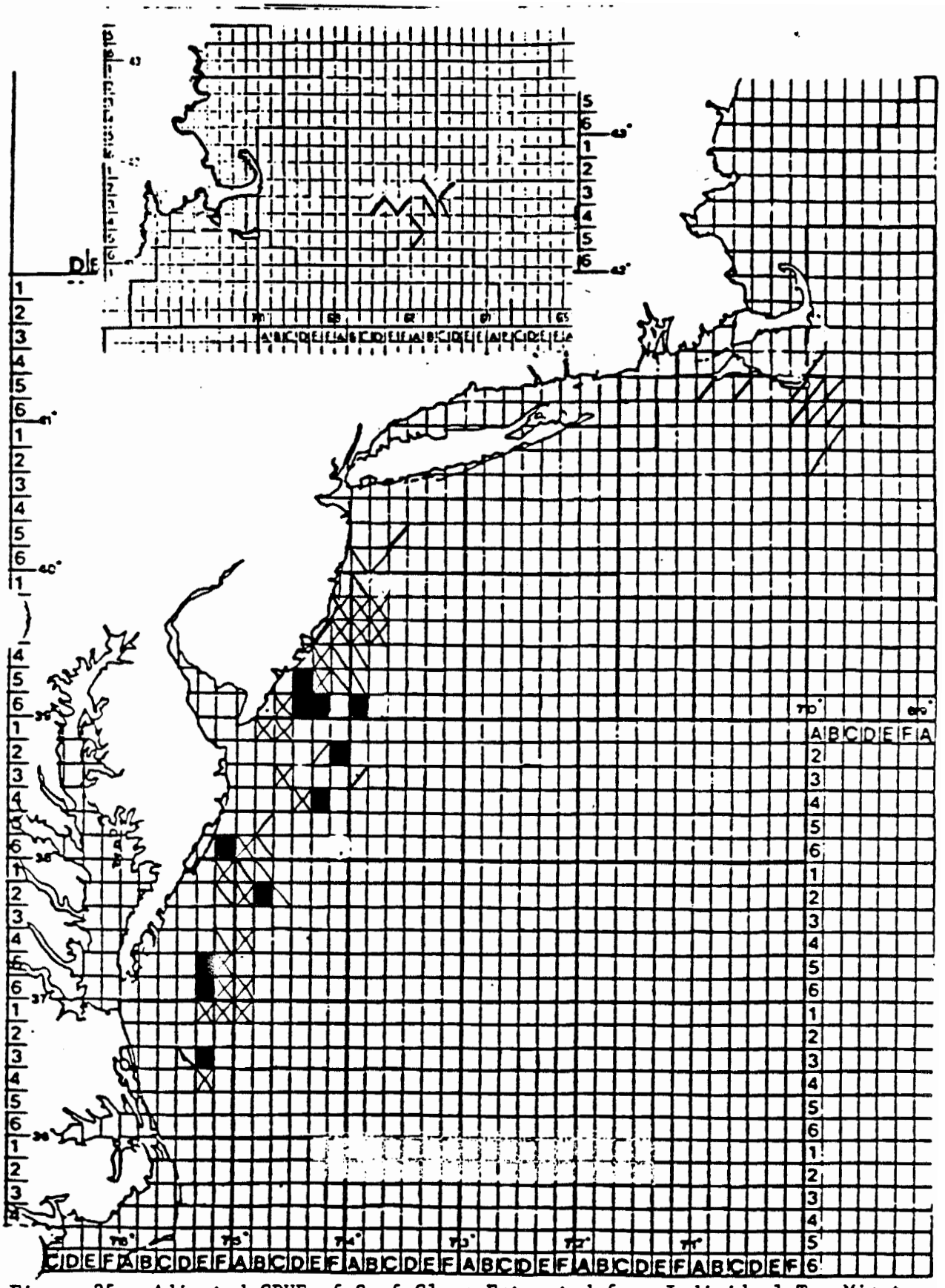

Figure 25. Adjusted CPUE of Surf Clams Extracted from Individual Ten Minute Squares, 1987. Source: NMFS NER logbook data.

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X = 350 to 500 bushels/hour
■ = greater than 500 bushels/hour

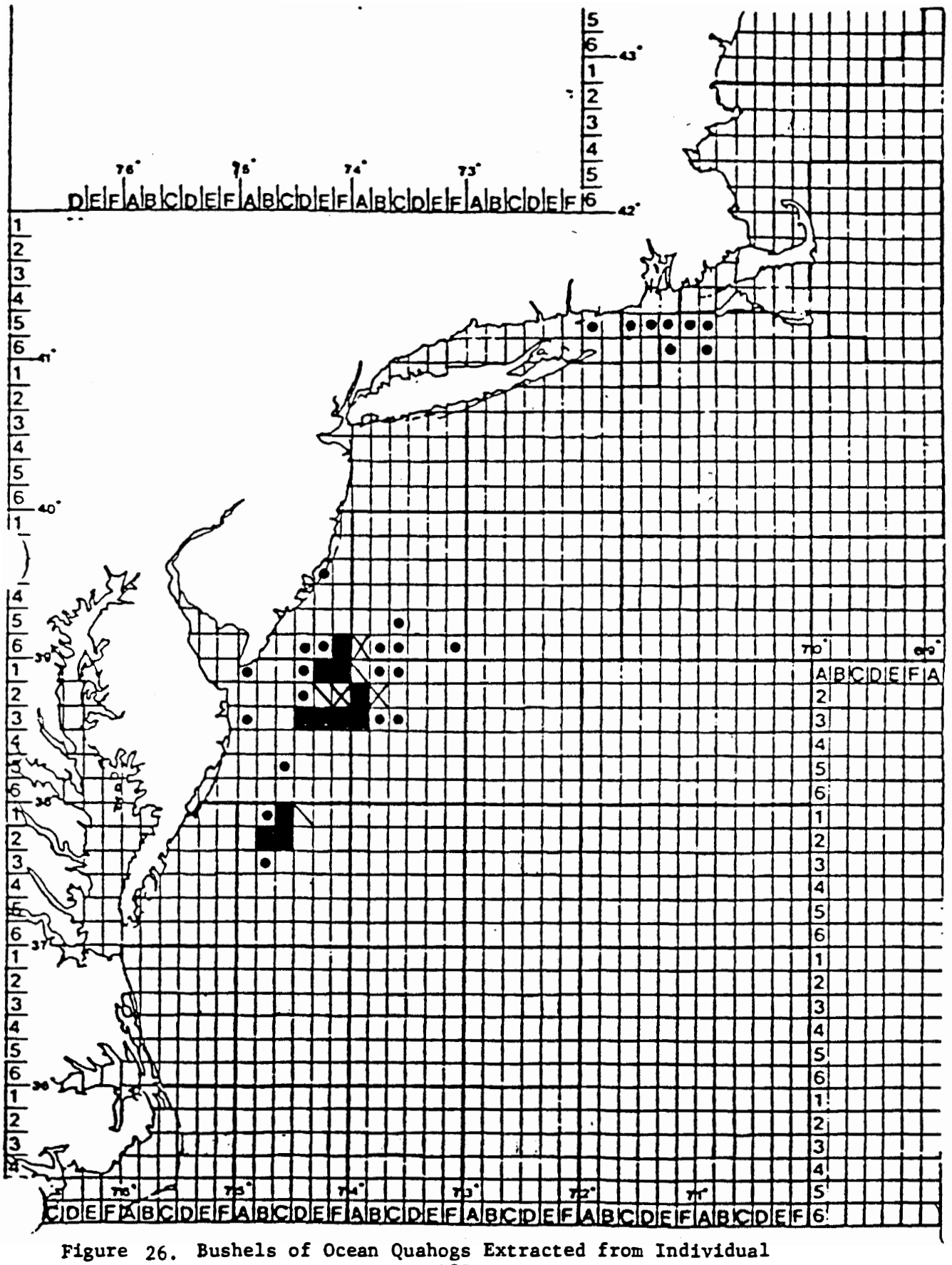

Figure 26. Bushels of Ocean Quahogs Extracted from Individual Ten Minute Squares, 1983. Source: NMFS NER logbook data.

● = confidential
/ = less than 10,000 bushels
\ = 10,000 to 50,000 bushels
X = 50,000 to 100,000 bushels
■ = greater than 100,000 bushels

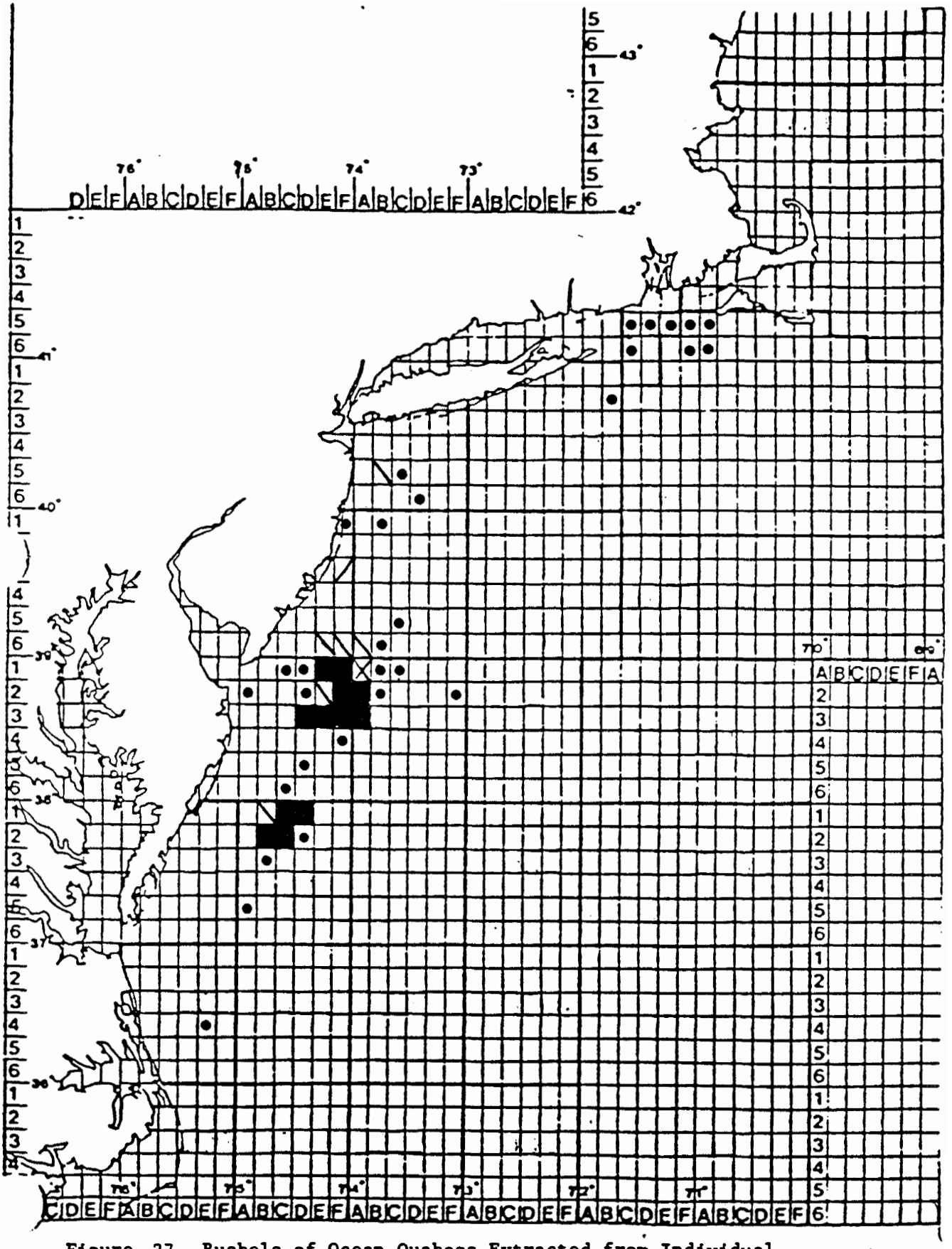

Figure 27. Bushels of Ocean Quahogs Extracted from Individual Ten Minute Squares, 1984. Source: NMFS NER logbook data.

● = confidential
/ = less than 10,000 bushels
\ = 10,000 to 50,000 bushels
X = 50,000 to 100,000 bushels
■ = greater than 100,000 bushels

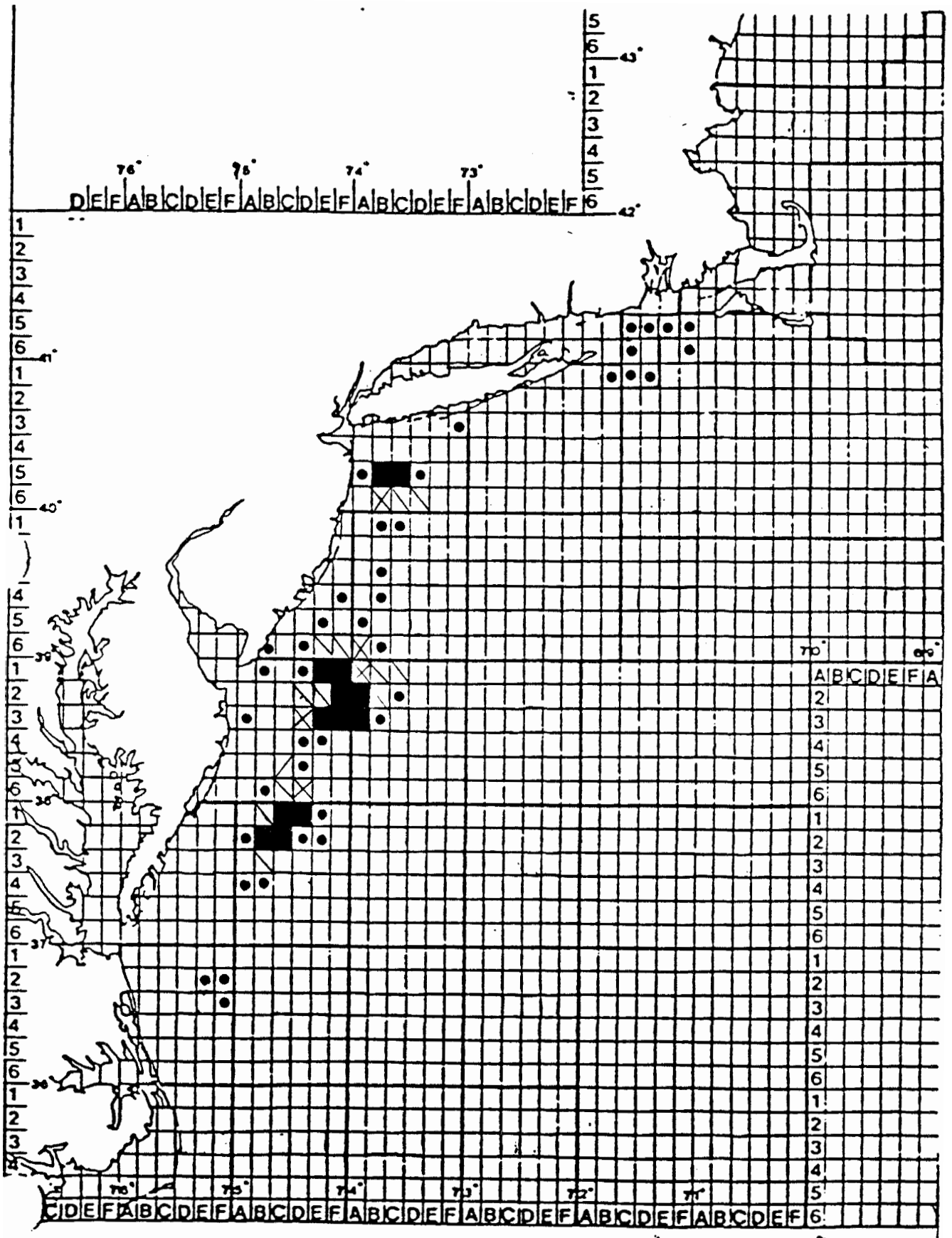

Figure 28. Bushels of Ocean Quahogs Extracted from Individual Ten Minute Squares, 1985. Source: NMFS NER logbook data.

● = confidential
/ = less than 10,000 bushels
\ = 10,000 to 50,000 bushels
X = 50,000 to 100,000 bushels
■ = greater than 100,000 bushels

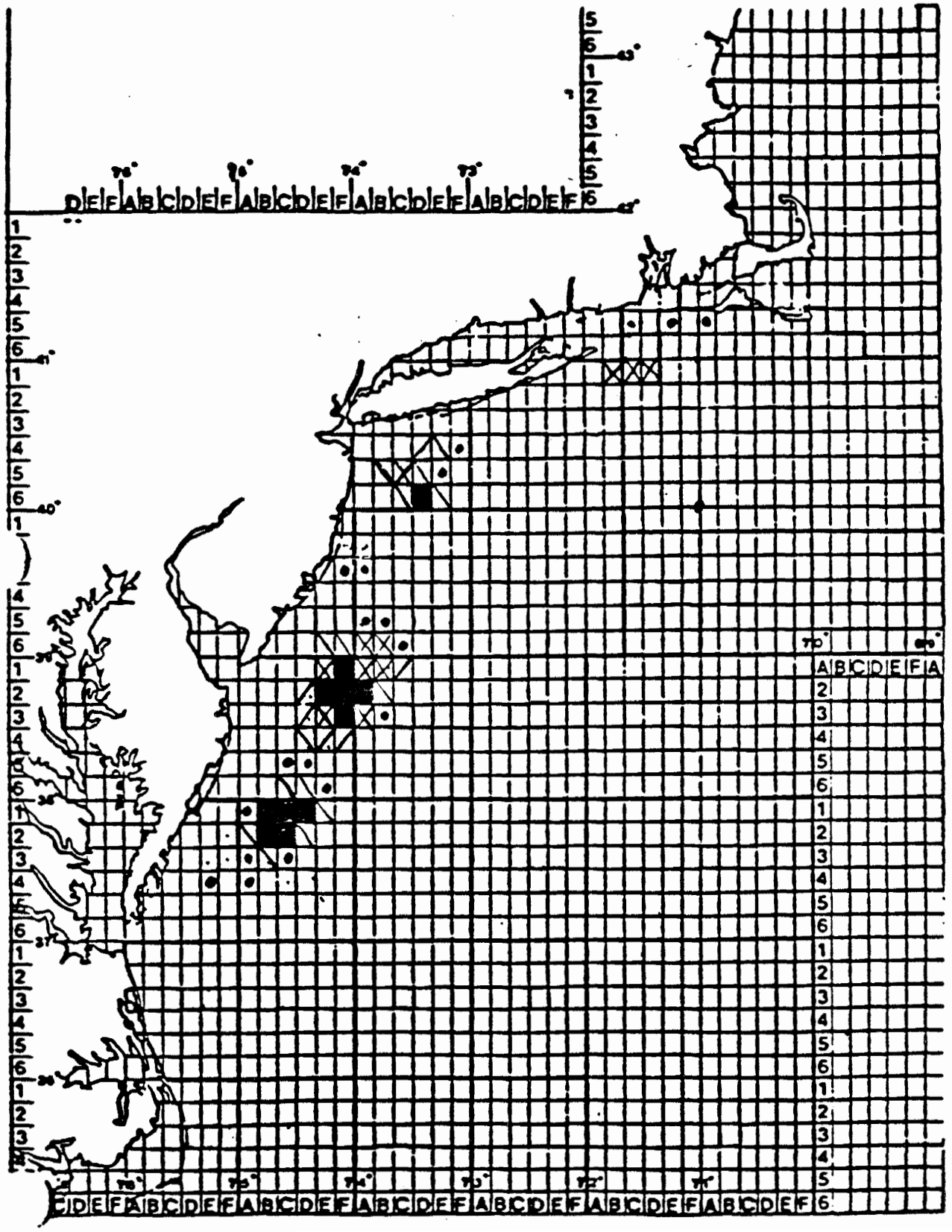

Figure 29. Bushels of Ocean Quahogs Extracted from Individual Ten Minute Squares, 1986. Source: NMFS logbook data.

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/ = less than 10,000 bushels
\ = 10,000 to 50,000 bushels
X = 50,000 to 1000,000 bushels
■ = greater than 100,000 bushels

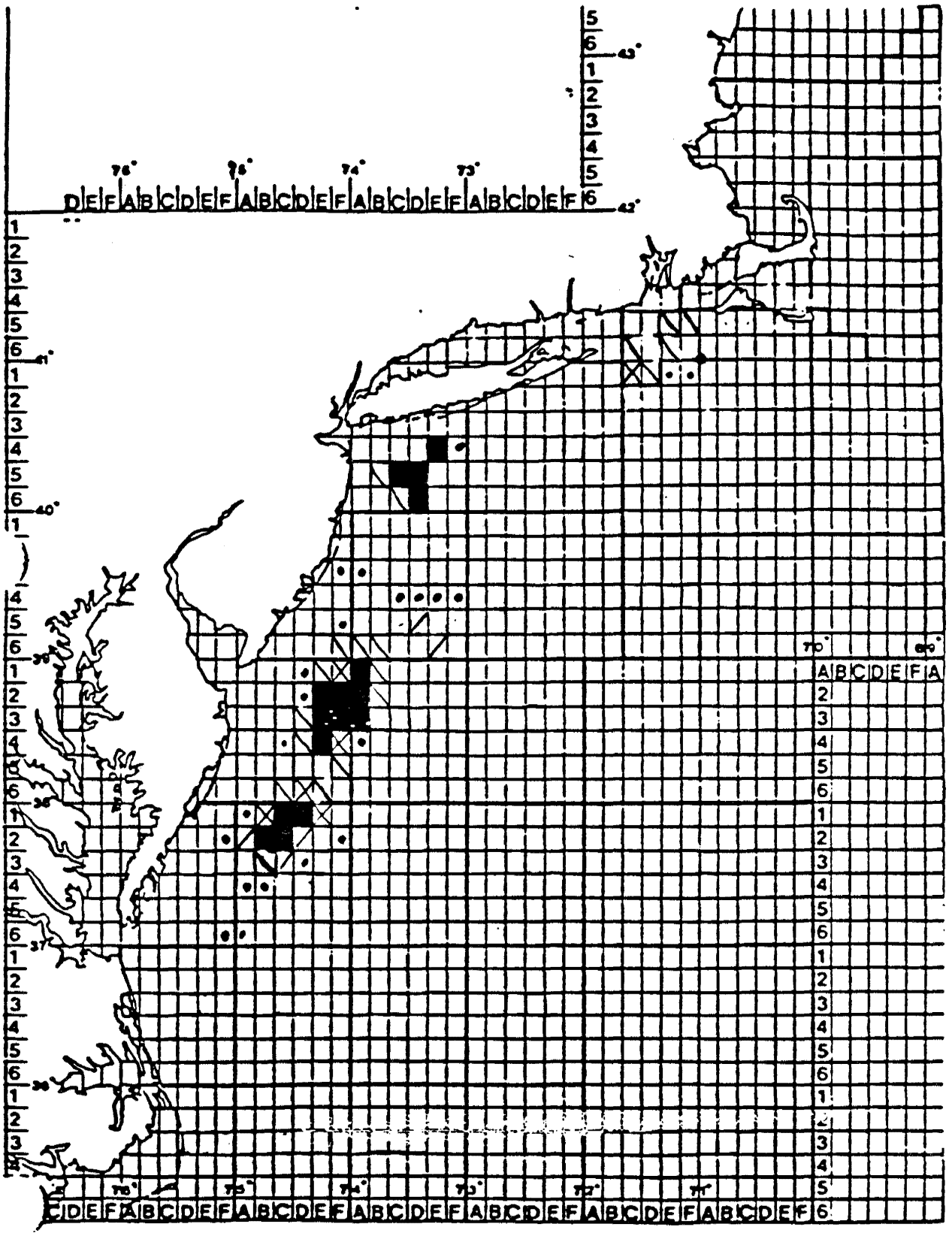

Figure 30. Bushels of Ocean Quahogs Extracted from Individual Ten Minute Squares, 1987. Source: NMFS logbook data.

● = confidential
/ = less than 10,000 bushels
\ = 10,000 to 50,000 bushels
X = 50,000 to 100,000 bushels
■ = greater than 100,000 bushels

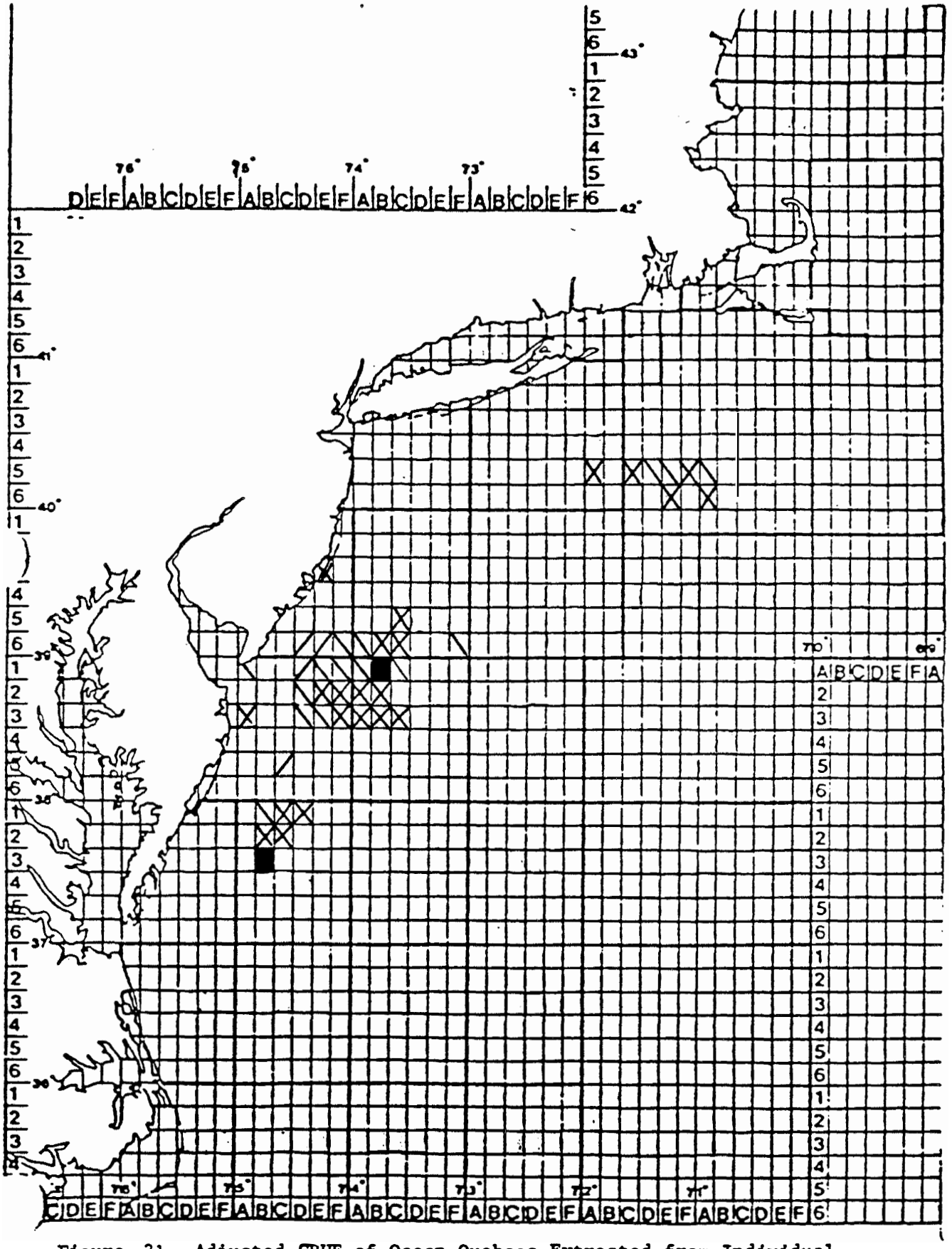

Figure 31. Adjusted CPUE of Ocean Quahogs Extracted from Individual Ten Minute Squares, 1983. Source: NMFS NER logbook data.

/ = less than 200 bushels/hour
\ = 200 to 350 bushels/hour
X = 350 to 500 bushels/hour
■ = greater than 500 bushels/hour

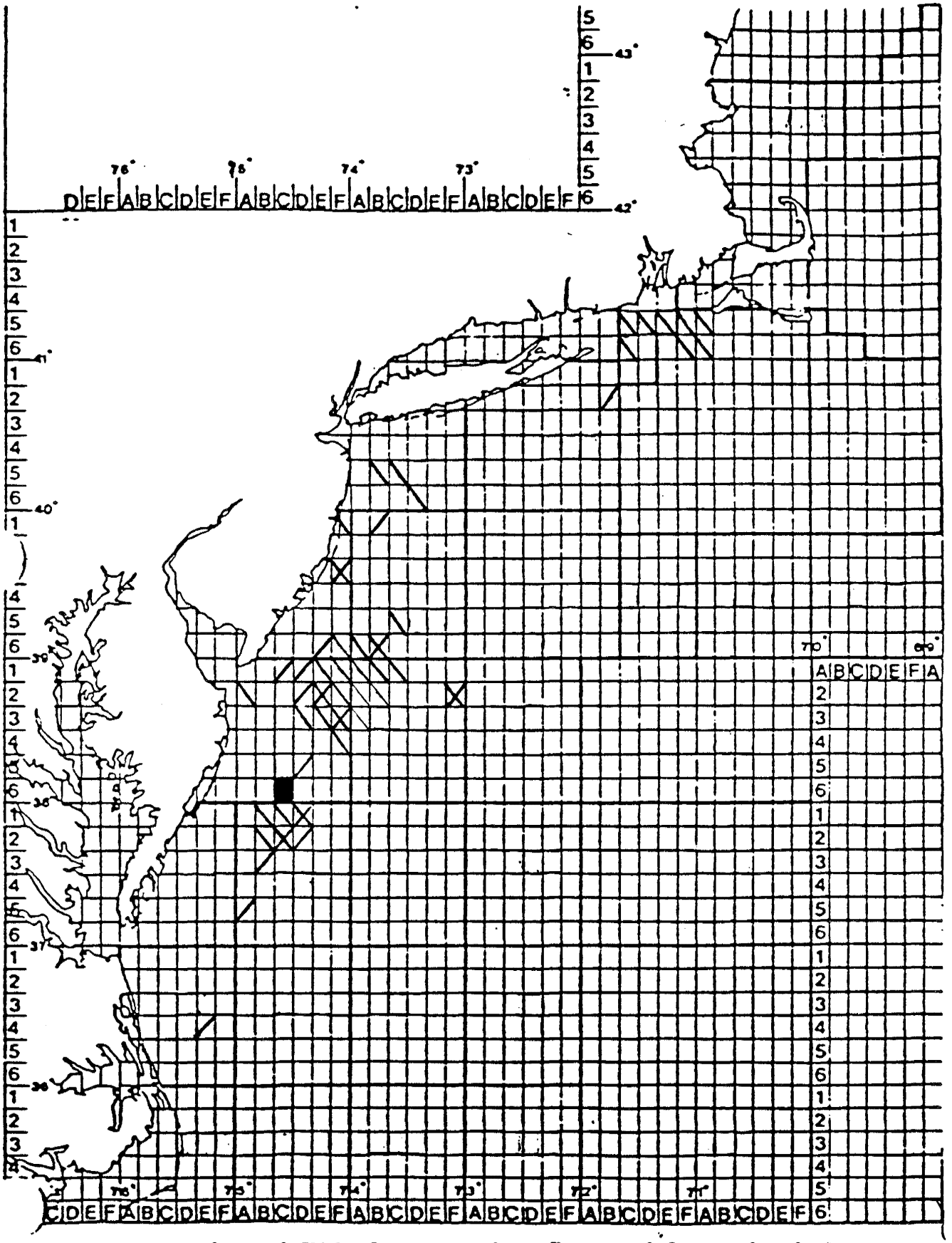

Figure 32. Adjusted CPUE of Ocean Quahogs Extracted from Individual Ten Minute Squares, 1984. Source: NMFS NER logbook data.

/ = less than 200 bushels/hour
\ = 200 to 350 bushels/hour
X = 350 to 500 bushels/hour
■ = greater than 500 bushels/hour

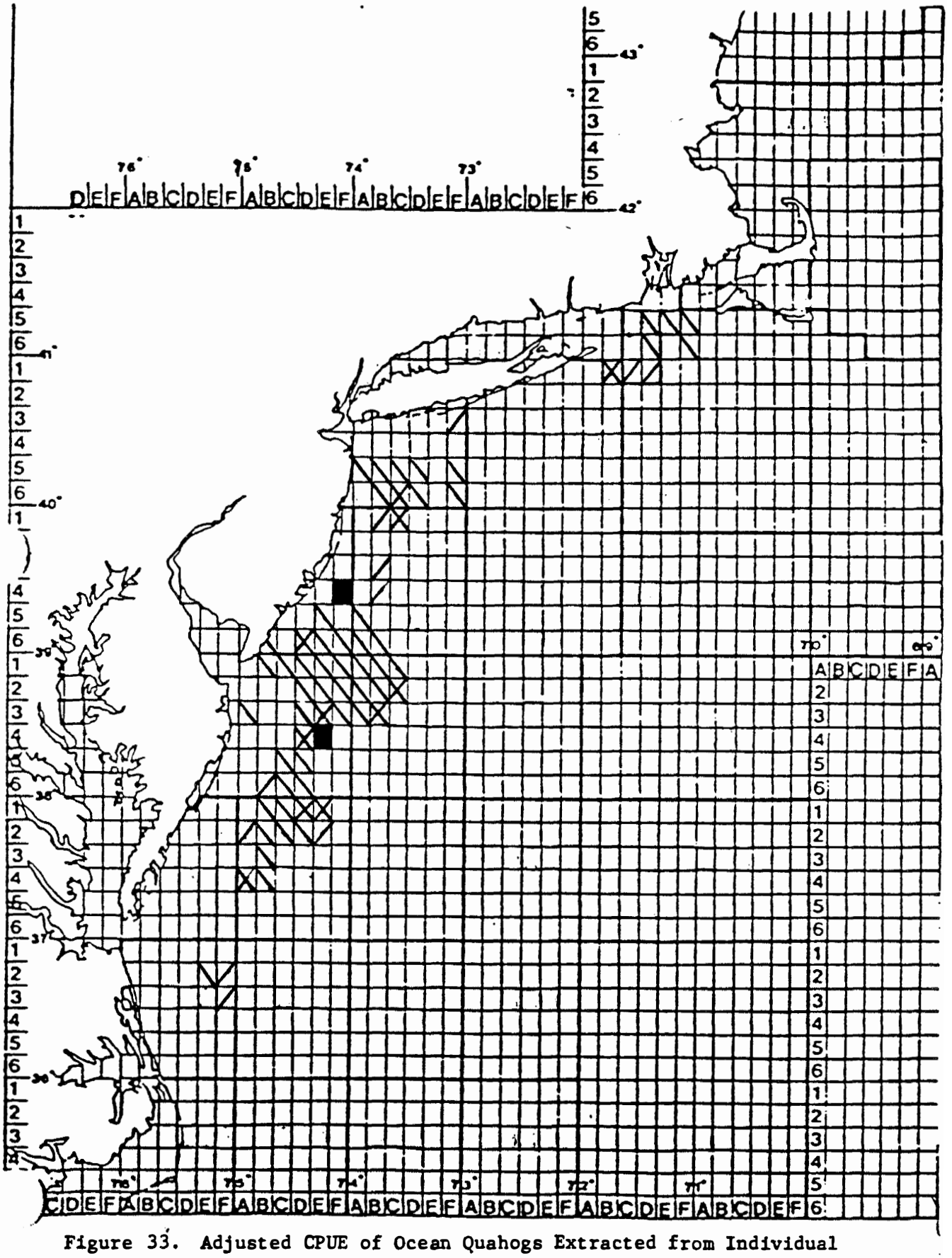

Figure 33. Adjusted CPUE of Ocean Quahogs Extracted from Individual Ten Minute Squares, 1985. Source: NMFS NER logbook data.

/ = less than 200 bushels/hour
\ = 200 to 350 bushels/hour
X = 350 to 500 bushels/hour
■ = greater than 500 bushels/hour

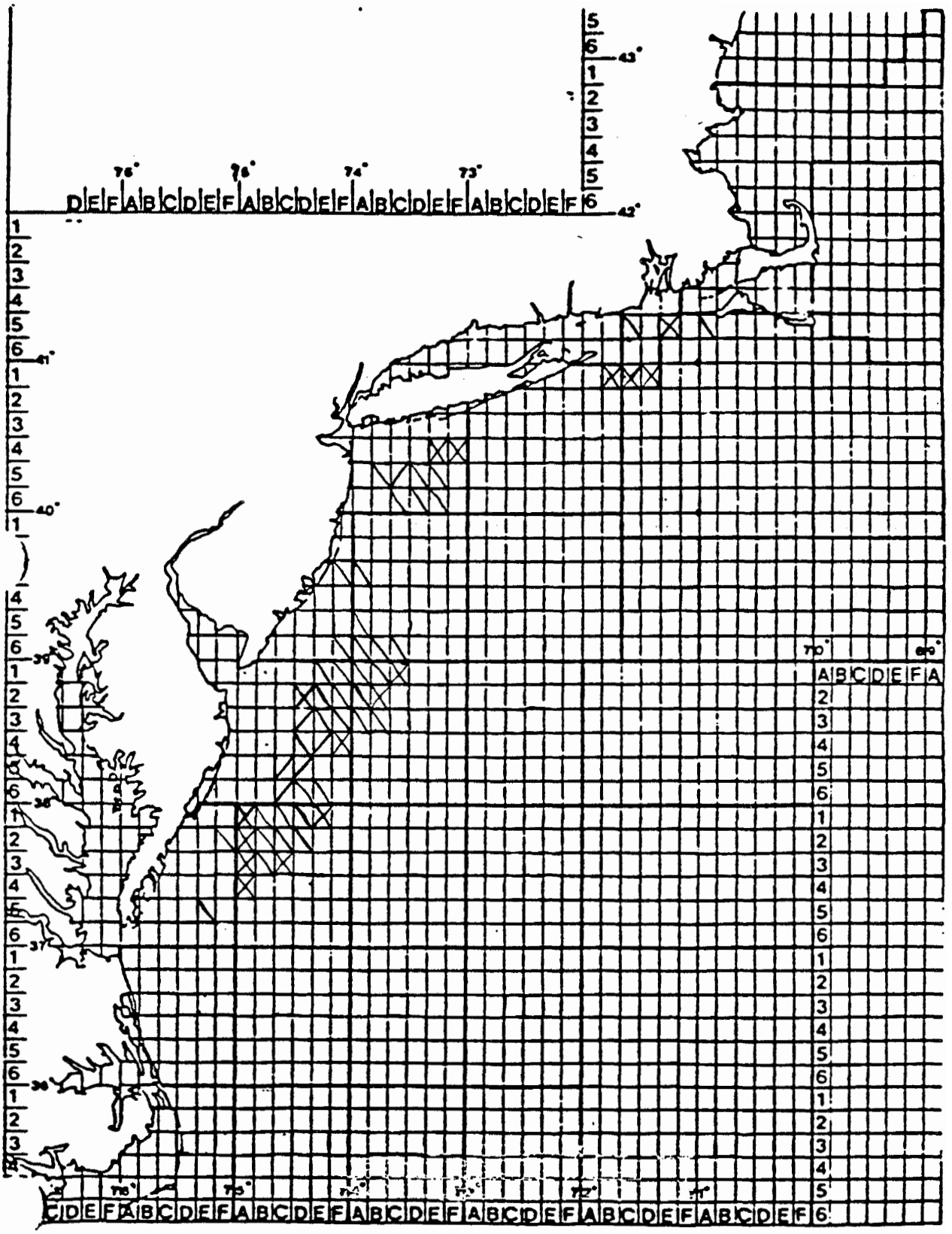

Figure 34. Adjusted CPUE of Ocean Quahogs Extracted from Individual Ten Minute Squares, 1986. Source: NMFS NER logbook data.

/ = less than 200 bushels/hour
\ = 200 to 350 bushels/hour
X = 350 to 500 bushels/hour
■ = greater than 500 bushels/hour

APPENDIX 1. ALTERNATIVES FOR THE PROPOSED AMENDMENT

1. INTRODUCTION

Several management measures in the current FMP are not to be changed in this Amendment and, therefore, will not be discussed in the following management measures or in the alternatives. These are the vessel and processor logbook requirement, the vessel permit requirement, the cage tag requirement, the procedure for setting annual quotas, the provisions to close areas either for containing concentrations of small surf clams or for environmental reasons, the vessel identification requirements, and the specification that US processors can process the entire catch of US fishermen, thus eliminating joint ventures and foreign fishing.

2. ALTERNATIVE MANAGEMENT REGIMES

2.1. Take no action at this time

This alternative is the same as the regime currently in effect. Management measures would be:

2.1.1. Permit Requirements

A vessel owner or operator must obtain a permit in order to conduct a directed fishery for surf clams or ocean quahogs within the EEZ or land or transfer to another vessel any surf clams or ocean quahogs or part thereof caught within the EEZ. Vessels taking surf clams or ocean quahogs for personal use are exempt from this requirement.

A vessel is eligible for a permit to harvest surf clams in both the New England and Mid-Atlantic Areas if it meets any of the following criteria:

a. The vessel has landed surf clams in the course of conducting a directed fishery for surf clams between 18 November 1976 and 17 November 1977; or

b. The vessel was under construction for, or was being rerigged for, use in the directed fishery for surf clams on 17 November 1977. For the purpose of this paragraph, "under construction" means that the keel has been laid, and "being rerigged" means physical alteration of the vessel or its gear had begun to transform the vessel into one capable of fishing commercially for surf clams; or

c. The vessel is replacing a vessel of substantially similar harvesting capacity which involuntarily left the surf clam fishery during the moratorium, and both the entering and replaced vessels are owned by the same person.

There are no eligibility restrictions for vessels fishing for surf clams in the New England Area. The New England Area is made up of the Nantucket Shoals and Georges Bank Areas.

There are no eligibility restrictions for vessels fishing for ocean quahogs.

Permit applications are processed by the Regional Director. The application form shall require provision of at least the following information: names, addresses, and telephone numbers of the owner and operator; the name of the vessel; the vessel's US Coast Guard documentation number or State license number; engine and pump horsepower; home port of the vessel; directed fishery or fisheries; fish hold capacity (in cages or bushels); dredge size; and number of dredges. The vessel owner or operator is required to notify NMFS of any changes of address or physical characteristics of vessels.

There is no fee for the initial permit. A lost or mutilated permit may be replaced at a cost of $25.

A permit is valid only for the vessel for which it is issued.

The permit must be carried, at all times, on board the vessel for which it is issued, and must be maintained in legible condition. The permit, the vessel, its gear, and catch are subject to inspection by any authorized official.

Permits expire when the owner or operator retires the vessel from the fishery (it is a rebuttable presumption that failure to land any surf clams or ocean quahogs for 52 consecutive weeks constitutes retirement from the fishery); when the ownership of the vessel changes; or on 31 December of each year. However, the Regional Director may authorize continuation of a vessel permit for the surf clam fishery if the new owner so requests and the vessel meets the relevant eligibility criteria.

Vessels that establish eligibility to fish in both the Mid-Atlantic and New England Areas need not re-establish such eligibility as part of the annual permit renewal.

Permits may be revoked by the Regional Director for violations of this FMP.

2.1.2. Effort restrictions

2.1.2.1. Surf clams - Mid-Atlantic Area

Fishing for surf clams shall be permitted only during the period beginning 6:00 am Sunday and ending 6:00 pm Thursday and be conducted during this period only at the times and under the conditions authorized by the Regional Director. If fishing is permitted for periods of 18 hours, 36 hours, or other time periods that are evenly divisible by 18, the Regional Director may permit fishing beginning at 12:00 am Sunday if, in consultation with the Council, he determines that enforcement resources are adequate to monitor this expanded fishing period. This shall be accomplished by publishing a notice in the *Federal Register*.

Fishing time shall be regulated by the Regional Director to allow fishing for surf clams to be conducted throughout the entire quarter without exceeding the allocation for that quarter and at a rate that will minimize the number of changes to allowed fishing times during the quarter. It is anticipated that the general method of regulating fishing times, both in reopened areas and in the fishery outside of reopened areas, will be regulating the hours per week each vessel may fish. However, catch rates, particularly in reopened areas, may be such that regulating hours per week may result in time periods so short that they are uneconomic for the harvesters. If this were to occur, the Regional Director may regulate hours over a longer time period (i.e., hours per month or hours per quarter) so that each vessel could have a reasonable trip, even though the total hours of permitted fishing for the time period might be quite small. Vessels shall be required to stop fishing at uniform hours.

The Regional Director shall regulate fishing times for reopened areas to allow fishing for surf clams to be conducted in such areas throughout the entire time period established for each area without exceeding the estimated allowable catch for the area and at a rate that will minimize the number of changes to the allowed fishing times during the quarter. Reopened areas shall be managed with specific estimates of allowable harvest and effort restrictions until the catch per unit of effort in the reopened area equals the general catch per unit of effort in the overall fishery. The Regional Director may designate the maximum number of vessels that may fish in a reopened area at any one time and, if conflicts develop between that number and the fishing periods requested by fishermen, he may select the vessels that fish on particular days by use of a lottery.

If the Regional Director determines during the quarter that the quarterly allocation will be (will not be) exceeded, he may reduce (increase) the number of hours during which fishing for surf clams is permitted to avoid prolonged vessel tie up times and fluctuations in the supply of surf clams which would result if the allocations were taken rapidly during the beginning of each quarter (facilitating the catch of the full quarterly allocation).

The Regional Director shall publish a notice in the *Federal Register* of any reduction or increase in days during which fishing for surf clams is permitted. The reduction or increase may take effect immediately upon publication in the *Federal Register*. The Regional Director shall also send notice of the change to each surf clam or ocean quahog processor in the fishery and to each surf clam or ocean quahog vessel owner or operator.

If NMFS continues the procedure of requiring surf clam fishermen to specify their fishing days, provision is made for an alternate fishing day in the event of unsafe weather conditions on the specified day. A fisherman may claim a weather day if the fisherman notifies the appropriate official designated by NMFS of his intent to claim a weather day within four hours of his official starting time for fishing and if he lands no clams on that day. This make up day shall be the next fishing day and shall amount to the same number of hours as the fisherman normally has on a fishing day. A fisherman will not be permitted to claim an additional make up day if weather conditions prohibited fishing on a make up day. This make up day provision shall be in effect only for the months of November, December, January, February, March, and April.

In addition to the effort restrictions in the current FMP presented above, surf clam vessels may land surf clams only one time during an authorized time period.

2.1.2.2. Surf Clams - Nantucket Shoals Area

In the Nantucket Shoals Area, no catch restrictions shall be applied to the fishery until 50% of the quarterly quota has been landed. The Regional Director will monitor landings from the Nantucket Shoals Area and will determine either when the 50% point has been reached or when that point will likely be reached. The Regional Director will thereupon consult with the Councils in the selection of trip limits to control catch adequately to keep the fishery open for the balance of the quarter. Trip limits will be established by vessel class as follows: for Class 1 vessels, trip limits may not be less than 224 bu/trip; for Class 2 vessels, trip limits may

not be less than 416 bu/trip for Class 2, and for Class 3 vessels, trip limits may not be less than 768 bu/trip. Trip limits must maintain a fixed ratio of 1.0: 1.8: 3.5 for Class 1, 2, and 3, respectively. In the event that trip limits are not sufficient to keep landings to within the quota levels, the Regional Director may close the fishery until the beginning of the next quota period.

Once initial trip limits have been established in consultation with the Councils, the Regional Director will notify the Councils in advance of any proposed action to further specify trip limits or close the fishery. The Regional Director will consider any comments received by the Councils or the public before implementing any adjustments in the Nantucket Shoals management program.

2.1.2.3. Surf Clams - Georges Bank Area

There are no effort restrictions for fishing for surf clams in the Georges Bank Area. When a quarterly quota has been caught, the fishery is closed.

2.1.2.4. Ocean Quahogs

Fishing for ocean quahogs is permitted seven days per week.

When 50% of the quota for ocean quahogs for any time period has been caught, the Regional Director shall determine whether the total catch of ocean quahogs during the applicable time period will exceed the quota for that time period. If the Regional Director determines that the quota probably will be exceeded, he may reduce the number of days per week during which fishing for ocean quahogs is permitted for the remainder of the time period. The Regional Director shall publish a notice in the *Federal Register* of any reduction in days or week during which fishing for ocean quahogs is permitted. The reduction shall be effective immediately upon publication in the *Federal Register*. The Regional Director shall also send notice of any reduction to each surf clam or ocean quahog processor in the fishery and to each surf clam or ocean quahog vessel owner or operator.

2.1.3. Size restriction

There is a surf clam minimum size limit. After consultation with the Council and opportunity for public comment, the Regional Director shall adjust, by increments no less than 0.25", the surf clam minimum size limit to a value less than 5.5" as necessary, so that discards on average do not exceed 30% of the trip catch. In no event shall the size limit be less than 4.75". When data indicate the clams have grown sufficiently, the limit would be increased, ultimately reaching the 5.5" limit. There is a tolerance of 240 undersized clams per cage but no more than 50 clams per cage under 4.75". If any cage is in violation of the size limit, the entire load is in violation. In adjusting the size limit the Regional Director shall consider current stock assessments, catch reports, and other relevant information concerning the size distribution of the surf clam resource. No person shall harvest or possess surf clams smaller than the minimum size limit.

All surf clams landed on an authorized EEZ fishing day are assumed to have been caught in the EEZ and are subject to the Federal size limit.

2.1.4. Other measures

All surf clams landed on an authorized EEZ fishing day are assumed to have been caught in the EEZ and are subject to the Federal size limit.

No person shall catch and retain on board any surf clams or ocean quahogs during closed seasons, in closed areas, or on days of the week during which fishing for these species is not permitted.

Possession of surf clams or ocean quahogs, by any person aboard any fishing vessel engaged in those fisheries, in closed areas or more than 12 hours after a closure announcement becomes effective shall be prima facie evidence that such clams or quahogs were taken in violation of the provisions of the Act and the regulations.

Possession of surf clams, by any person aboard any fishing vessel engaged in the surf clam fishery, more than 12 hours after a weekly closure occurs shall be prima facie evidence that such surf clams were taken in violation of the Act and the regulations.

No person shall possess, have custody of or control of, ship, transport, offer for sale, deliver for sale, sell, purchase, import, export, or land, any surf clams, ocean quahogs, or part thereof, which was taken in violation of the Act or any regulations issued under the Act.

No person engaged in the surf clam or ocean quahog fisheries as an owner or operator, or as a dealer, processor or buyer shall unload or cause to be unloaded, or sell or buy, any surf clams or ocean quahogs whether on land or at sea, without preparing and submitting the documents required by the regulations.

No person shall refuse to permit an authorized officer to board a fishing vessel subject to such person's control for purposes of conducting any search, no matter where that vessel may be situated, in connection with the enforcement of the Act or any regulations issued under the Act; forcibly assault, resist, oppose, impede, intimidate or interfere with any authorized officer in the conduct of any search or inspection; resist a lawful arrest for any act prohibited by the regulations; or interfere with, delay, or prevent, by any means, the apprehension or arrest of another person knowing that such other person has committed any act prohibited by the regulations.

Vessel owners or operators must notify NMFS in advance if they intend to fish for surf clams in a Notification Zone. For vessels authorized to fish in both the Mid-Atlantic and New England Areas (i.e., with permits issued pursuant to the moratorium) with home ports in the Mid-Atlantic Area the Nantucket Shoals or Georges Bank Areas are Notification Zones. For vessels authorized to fish in both the Mid-Atlantic and New England Areas (i.e., with permits issued pursuant to the moratorium) with home ports in the New England Area the Mid-Atlantic or Georges Bank Areas are Notification Zones. For vessels authorized to fish only in the New England Area the Georges Bank Area is a Notification Zone. Home port is that specified on the vessel's permit application form. If an operator intends to change the vessel's Area of fishing, NMFS must be notified in advance.

Any person or vessel found to be in violation of these regulations, including the logbook and other reporting requirements, shall be subject to the civil and criminal penalty provisions and forfeiture provisions prescribed in the Act and pertinent regulations. It is recommended that the Secretary establish a specific list of penalties for specific civil violations of these regulations in order to expedite resolution of violations. It is recommended that the penalty for a first offense for any violation be a permit suspension for thirty days and that the penalty for a second offense be a permit suspension for ninety days. Subsequent offenses should carry penalties of a permit suspension combined with a fine. Appropriate fines should be specified for violations by processors.

The owner or operator of any vessel subject to these regulations shall immediately comply with instructions issued by authorized officers to facilitate boarding and inspection of the vessel for the purpose of enforcing the Act and the regulations. Upon being approached by a Coast Guard cutter or aircraft, or other vessel or aircraft authorized to enforce the Act, the vessel shall be alert for signals conveying enforcement instructions. Standard signals and requirements should be developed and implemented by regulations.

2.1.5. Evaluation of the Alternative

2.1.5.1. Positive Impacts

The most important benefit of the current Plan is conservation of the resource provided by the quota and size limit provisions. It is one of the few fisheries for which the effects of overfishing and stock decline have been successfully reversed, and this benefit can be expected to continue if the Plan remains in place.

Secondly, while the current time based management system is problematic in many ways, it may be argued that it has been equitable to fishermen in the sense that each vessel has equal access to the surf clam resource of the Mid-Atlantic.

2.1.5.2. Negative Impacts

While the current biological health of the surf clam and ocean quahog resources is favorable, the harvesting and processing industries which depend upon them are only marginally profitable. Enormous economic inefficiencies result from the existing overcapitalization of the fleet. Current estimates of net revenues to the harvesting sector are under $1 million on gross revenues of over $40 million (Section 8). The primary reason for this state of affairs is overcapacity in the harvesting sector which the current management system does not address adequately. If the "no action" alternative is chosen, this situation will continue.

Time based management as it exists in the FMP's implementing regulations is inflexible and imposes an unnecessary level of governmental involvement in fishing industry practices. For effective enforcement, a relatively long lead time of ten days has been required for choosing fishing days. This severely restricts short term planning by vessel owners. In addition, make up days for bad weather cancellations must be scheduled on the following day, an interval which is often too short for conditions to stabilize.

Safety concerns have also been voiced relative to the aging of the current clam fleet. The moratorium on new entrants into the fishery has created an almost static fleet, where the average vessel age is currently 25 years.

While vessel replacement is permitted for "involuntary retirement," the need to limit fishing power under the time based system has required that replacement vessels be of equal fishing power to the original. This has led to three inefficient results. First, in most cases there should not be a replacement vessel. Given the overcapitalized state of the fleet, old, unsafe vessels should be allowed to retire and their fishing privileges transferred to another *existing* vessel. Second, the government should not be deciding for fishermen how large a vessel they can employ, as this amounts to regulating inefficiency. Third, an accurate determination of the relative fishing power of two hulls is very difficult to achieve. An unambiguous set of replacement rules has yet to be agreed upon, leaving room for some uncertainty on the part of both fishermen and government officials as to the merits of any particular replacement request. All of these concerns can be met by one or more of the proposed alternatives in this Amendment.

Crew recruitment has also been impacted by the long lay up periods between allowed surf clam fishing trips. Harvest of New Jersey inshore clams and ocean quahogs have served to take up some of the slack, however vessel owners have found they cannot always compete favorably with shoreside opportunities for competent help.

Finally, the time based system requires costly at sea enforcement to ensure that fishermen have their dredges in the water during authorized hours, and only on their authorized days.

2.1.5.3. Net Benefits Relative to Other Alternatives

The no action alternative must be considered one of the least beneficial of those proposed in this Amendment. All remaining alternatives except unlimited access provide at least some modest improvement over the status quo.

2.2. Permit Unlimited Access to the Surf Clam Fishery and Eliminate Effort Restrictions

This alternative would eliminate effort restrictions and entry limitations. The New England and Mid-Atlantic Areas would be combined, so the OY would be revised and the surf clam minimum size limit would apply throughout the management unit. Reporting requirements would continue unchanged. Management measures would be:

2.2.1. Permit Requirements

A vessel owner or operator must obtain a permit in order to conduct a directed fishery for surf clams or ocean quahogs within the EEZ or land or transfer to another vessel any surf clams or ocean quahogs or part thereof caught within the EEZ. Vessels taking surf clams or ocean quahogs for personal use are exempt from this requirement.

There are no eligibility restrictions for vessels fishing for surf clams or ocean quahogs.

Permit applications are processed by the Regional Director. The application form shall require provision of at least the following information: names, addresses, and telephone numbers of the owner and operator; the name of the vessel; the vessel's US Coast Guard documentation number or State license number; engine and pump horsepower; home port of the vessel; directed fishery or fisheries; fish hold capacity (in cages or bushels); dredge size; and number of dredges. The vessel owner or operator is required to notify NMFS of any changes of address or physical characteristics of vessels.

There is no fee for the initial permit. A lost or mutilated permit may be replaced at a cost of $25.

A permit is valid only for the vessel for which it is issued.

The permit, the vessel, its gear, and catch are subject to inspection by any authorized official upon landing.

Permits expire: when the owner or operator retires the vessel from the fishery; or when the ownership of the vessel changes, however, the Regional Director may authorize continuation of a vessel permit for the surf clam fishery if the new owner so requests and the vessel meets the relevant eligibility criteria; or on 31 December of each year.

Permits may be revoked by the Regional Director for violations of this FMP.

2.2.2. Effort restrictions

Fishing for surf clams and ocean quahogs is permitted seven days per week.

There are no effort limitations.

2.2.3. Size restriction

There is a surf clam minimum size limit. After consultation with the Council and opportunity for public comment, the Regional Director shall adjust, by increments no less than 0.25", the surf clam minimum size limit to a value less than 5.5" as necessary, so that discards on average do not exceed 30% of the trip catch. In no event shall the size limit be less than 4.75". When data indicate the clams have grown sufficiently, the limit would be increased, ultimately reaching the 5.5" limit. There is a tolerance of 240 undersized clams per cage but no more than 50 clams per cage under 4.75". If any cage is in violation of the size limit, the entire load is in violation. In adjusting the size limit the Regional Director shall consider current stock assessments, catch reports, and other relevant information concerning the size distribution of the surf clam resource. No person shall harvest or possess surf clams smaller than the minimum size limit.

All surf clams landed on an authorized EEZ fishing day are assumed to have been caught in the EEZ and are subject to the Federal size limit.

2.2.4. Evaluation of Alternative

2.2.4.1. Positive Impacts

Removal of the Mid-Atlantic surf clam moratorium would allow new fishermen to enter the fishery at no cost beyond that of their vessel and equipment. Currently, the only means of entry is through purchase of an existing vessel, which holds a price premium due to the capitalized value of its moratorium permit.

Unlimited access may reduce at sea enforcement costs to some extent, though this is questionable since additional entry into the fleet may stress the stocks to the point where monitoring of the size limit and discards has to be increased.

Unlimited access does address the problem of replacing an aging fleet with newer, more efficient vessels, since there would no longer be any restrictions on vessel replacement.

2.2.4.2. Negative Impacts

Elimination of the moratorium would permit an influx of new vessels and further aggravate the overcapitalization problem. Additional entry into the fishery would require that the existing quota be divided even more finely among the increased number of participants. Substantial negative impacts can be expected on individual vessel revenues.

Individuals who were participants in the Mid-Atlantic surf clam fishery when the moratorium was first announced were able to obtain moratorium permits free of charge. However, those who entered at a later date through purchase of an existing vessel paid a premium equal to the market value of the permit at the time. If the moratorium is simply removed, the value of his investment in the permit is instantly reduced to zero.

Elimination of the time based management system and a quarterly number of allowed trips would leave only the use of closures to prevent exceeding the annual quota. This would motivate a return to the "gold rush" mentality, where vessels (and their buyers) compete to harvest the shell stock they need before the quarterly quota is reached and the fishery is closed. This would result in a chronic situation of extensive closures, processors holding costly inventories, and vessel employment instability. Extensive closures also negatively impact processing plant employment, with probable layoffs during times of closure; the very situation that effort limitations were in large part designed to minimize.

Additional vessels and compressed fishing times also create larger administrative and enforcement burdens. A greater number of logbooks would have to be processed in a shorter period of time to ensure that the quota is not exceeded. Boats may be forced to find more dock space as many attempt to land at the same time. Enforcement agents would be hard pressed to cover the additional landing areas.

Fishing under time pressure would encourage captains to ignore the size limit (which would be maintained in this alternative), incur greater breakage of shell stock, and increase the probability of exceeding the quota. Pressure to have all vessels fishing simultaneously would prohibit vessels owners from using one crew on more than one vessel, exacerbating crew recruitment problems.

The frequent cycle of opening and closing the fishery may have adverse effects on vessel insurance rates.

Relative to price impacts, additional vessels would mean that processors would have more vessels to buy from. The increased competition among vessels should lead to lower ex-vessel prices. However, at some

point the average cost per bushel harvested would likely increase as a result of a lower catch per vessel (more vessels catching the same quota and possible reductions in allowed fishing times). This would present a cost/price problem to harvesters, especially those not directly associated with processors. In addition, the lack of effort limitations would likely lead to a very unstable price situation as processors attempt to get the clams they need prior to a possible quarterly closure. In other words, processors could offer lower prices because there would be more vessels attempting to sell clams, but this could be offset by the need of the processors to hedge against a closure by perhaps offering higher prices for short time periods to get the clams.

Finally, consumers will be impacted if the flow of product from the processors is not steady because of quarterly closures. An uneven flow causes prices to rise.

2.2.4.3. Net Benefits Relative to Other Alternatives

As is clear from the massive weight of the negative impacts of open access, this is the least beneficial of all proposed alternatives, including that of no action.

2.3. Institute a transferable allocation system in the Mid-Atlantic surf clam fishery only - Initial allocations would be based on either: historical participation, vessel dimensions, or a vessel's best trip - Management of ocean quahogs and New England surf clams would remain unchanged

Under this system, each vessel in the Mid-Atlantic surf clam fleet would be allocated a share of the overall annual quota. The New England and Mid-Atlantic Areas would not be combined. The quota setting, reporting, and area closure provisions of the existing plan would be continued unchanged. The surf clam effort limitation provisions in the Mid-Atlantic Area (quarterly quotas, fishing week, reduced hours, and bad weather makeup day) would be dropped. The permitting provisions would be changed to remove the moratorium on entry of additional vessels into the Mid-Atlantic Area surf clam fishery, although vessels would not be permitted to land surf clams in the Mid-Atlantic Area without an allocation.

Allocations would be on a percentage basis so that the amount of the allocation would vary as the quota varies from year to year.

Following the initial allocation, allocations could be sold. There would be no limitations on vessels; i.e., permitted vessels could be replaced and new vessels could be issued permits, the only limitation being that a vessel could not land surf clams without an allocation and a permit in the Mid-Atlantic Area.

Management measures would be:

2.3.1. Permit Requirements

A vessel owner or operator must obtain a permit in order to conduct a directed fishery for surf clams or ocean quahogs within the EEZ or land or transfer to another vessel any surf clams or ocean quahogs or part thereof caught within the EEZ. A permit is a necessary but not sufficient condition for the legal harvest of surf clams in the Mid-Atlantic Area, as these vessels must have tags for each unit of harvest. Vessels taking surf clams or ocean quahogs for personal use are exempt from this requirement.

There are no eligibility restrictions for vessels fishing for surf clams or ocean quahogs.

Permit applications are processed by the Regional Director. The application form shall require provision of at least the following information: names, addresses, and telephone numbers of the owner and operator; the name of the vessel; the vessel's US Coast Guard documentation number or State license number; engine and pump horsepower; home port of the vessel; directed fishery or fisheries; fish hold capacity (in cages or bushels); dredge size; and number of dredges. The vessel owner or operator is required to notify NMFS of any changes of address or physical characteristics of vessels.

There is no fee for the initial permit. A lost or mutilated permit may be replaced at a cost of $25.

A permit is valid only for the vessel for which it is issued.

The permit must be carried, at all times, on board the vessel for which it is issued, and must be maintained in legible condition. The permit, the vessel, its gear, and catch are subject to inspection by any authorized official.

Permits expire: when the owner or operator retires the vessel from the fishery; or when the ownership of the vessel changes, however, the Regional Director may authorize continuation of a vessel permit for the surf clam fishery if the new owner so requests; or on 31 December of each year.

Permits may be revoked by the Regional Director for violations of this FMP.

2.3.2. Effort restrictions

2.3.2.1. Surf clams - Mid-Atlantic Area

There are no effort restrictions for fishing for surf clams in the Mid-Atlantic Area.

2.3.2.2. Surf Clams - Nantucket Shoals Area

In the Nantucket Shoals Area, no catch restrictions shall be applied to the fishery until 50% of the quarterly quota has been landed. The Regional Director will monitor landings from the Nantucket Shoals Area and will determine either when the 50% point has been reached or when that point will likely be reached. The Regional Director will thereupon consult with the Councils in the selection of trip limits to control catch adequately to keep the fishery open for the balance of the quarter. Trip limits will be established by vessel class as follows: for Class 1 vessels, trip limits may not be less than 224 bu/trip; for Class 2 vessels, trip limits may not be less than 416 bu/trip for Class 2, and for Class 3 vessels, trip limits may not be less than 768 bu/trip. Trip limits must maintain a fixed ratio of 1.0: 1.8: 3.5 for Class 1, 2, and 3, respectively. In the event that trip limits are not sufficient to keep landings to within the quota levels, the Regional Director may close the fishery until the beginning of the next quota period.

Once initial trip limits have been established in consultation with the Councils, the Regional Director will notify the Councils in advance of any proposed action to further specify trip limits or close the fishery. The Regional Director will consider any comments received by the Councils or the public before implementing any adjustments in the Nantucket Shoals management program.

2.3.2.3. Surf Clams - Georges Bank Area

There are no effort restrictions for fishing for surf clams in the Georges Bank Area.

2.3.2.4. Ocean Quahogs

Fishing for ocean quahogs is permitted seven days per week.

When 50% of the quota for ocean quahogs for any time period has been caught, the Regional Director shall determine whether the total catch of ocean quahogs during the applicable time period will exceed the quota for that time period. If the Regional Director determines that the quota probably will be exceeded, he may reduce the number of days per week during which fishing for ocean quahogs is permitted for the remainder of the time period. The Regional Director shall publish a notice in the *Federal Register* of any reduction in days or week during which fishing for ocean quahogs is permitted. The reduction shall be effective immediately upon publication in the *Federal Register*. The Regional Director shall also send notice of any reduction to each surf clam or ocean quahog processor in the fishery and to each surf clam or ocean quahog vessel owner or operator.

2.3.3. Vessel Allocations in the Mid-Atlantic Area Surf Clam Fishery

2.3.3.1. General

The basic instrument will be called an Individual Transferable Quota (ITQ) and will be denominated as a percentage of the total annual quota. Each year owners of the ITQs will be allocated cage tags which will allow them to harvest a given number of cages based on their percent overall share at the time and the total annual quota. ITQs and the annual issue of tags and portions of both are transferable, but the actual harvest must be taken with a permitted vessel. Surf clams may not be landed without an allocation. Allocations are on a percentage basis so that the amount of the allocation varies as the quota varies from year to year. Allocations and portions of allocations are transferable.

Allocation formula alternatives are presented in Appendix 2.

2.3.3.2. Individual Annual Allocations

Once the final annual quota for Mid-Atlantic Area surf clams has been published by the Regional Director, NMFS will calculate each Individual Annual Allocation (IAA) by applying the appropriate ITQ percentage to the annual quota. These bushel allocations will then be divided by 32 to yield the appropriate number of cages for which cage tags may be issued. The IAA therefore becomes some number of cage tags. As with ITQs, IAA cage tags may be sold to other individuals; however, they are valid only for the calendar year for

which they are issued. In this way fishermen have the flexibility to sell their harvest rights for all future years (by selling their ITQ), or "renting" them for one year by selling their IAA cage tags.

There are no restrictions on the permitted use of the quota (i.e., an owner does not have to harvest his or her share) or on the time or method of harvest other than it must be landed in a permitted vessel during the year for which the IAA was issued). An ITQ owner may obtain a permitted vessel to harvest his or her IAA (whether obtained by initial allocation or by purchase, rental, lease, or joint venture arrangement) or he or she may contract for the IAA to be caught by any permitted vessel.

2.3.4. Evaluation of Alternative

2.3.4.1. General

As with Alternative 2.3, this alternative resembles the preferred alternative in general, and simply leaves out certain of its provisions. Here, the size limit would still be maintained, and both quahogs and New England clams would still be subject to effort limitations. Overall benefits, therefore, would be the same as those discussed in Chapter 9, except that this alternative: 1) fails to manage these resources uniformly throughout their range, 2) fails to capture the economic benefits of transferable allocations for ocean quahog fishermen and New England clammers, and 3) permits both economic and biological waste through discards to occur in not allowing for suspension of the size limit at times when average clam sizes are large.

2.3.4.2. Disadvantages

Allocations only in the Mid-Atlantic Area for surf clams would mean that owners of multiple vessels could combine their allocations, thereby freeing harvesting capacity to fish for ocean quahogs or for surf clams in the Nantucket Shoals and Georges Bank Areas. Quite likely this would negatively impact owners of one or a small number of vessels since they could lose markets. Also, it would negatively impact fishermen operating in the New England Area, since the excess harvesting capacity from the Mid-Atlantic Area could be efficiently employed in the New England Area. Given that the Mid-Atlantic based vessels would likely be larger than the New England based vessels, it would be difficult for the New England based vessels to maintain their market share.

2.3.4.3. Net Benefits Relative to Other Alternatives

Net benefits from this alternative are considered to be on a middle level: not as high as those which could be achieved with the preferred alternative, but a definite improvement over the status quo.

2.4. Institute a moratorium on entry of new vessels into the ocean quahog fishery

2.4.1. Description of Alternative

Initially there would be only a moratorium on entry of additional vessels into the ocean quahog fishery. To qualify for a permit under this moratorium, a vessel must currently hold a valid permit under the moratorium on entry of vessels into the Mid-Atlantic Areas surf clam fishery, or must have recorded logbook landings of ocean quahogs during the period 1 January 1979 through 31 December 1987, or must be documented as being under construction or being rerigged for the ocean quahog fishery as of 31 December 1987. After two years of operation under this moratorium there would be an allocation, with the initial ocean quahog distribution based on the following formula:

(1) The average ocean quahog catch (in bushels) that each permitted vessel caught (based on logbook reports) for those years the vessel actually reported landings for calendar years 1979 through 1987 would be determined.

(2) The sum of all of the vessels' averages would be divided into each vessel's average to calculate each vessel's ratio of the total.

(3) The ratio would be applied to each year's annual quota to calculate each vessel's annual allocation..

Following the initial allocation, ocean quahog allocations could be transferred. There would be no limitations on vessels except that a vessel could not land ocean quahogs without an allocation. Since there would be no limit on ocean quahog allocation transfers, boats with surf clam and quahog allocations could transfer the quahog allocations (except for trading rules as yet to be determined), even if the surf clam the phase in period is still in effect.

2.4.2. Evaluation of Alternative

2.4.2.1. Positive impacts

Instituting a moratorium on entry into the ocean quahog fishery would attempt to place a cap on total effort, and bring management on a par with the surf clam fishery. As with the original moratorium on Mid-Atlantic surf clam vessels, it is only conceived as a transitional measure to be replaced with an allocation system as soon as possible.

Its major benefit is simply as a response to the concerns of some quahog fishermen who have participated in the fishery only a short time, and feel that they have had insufficient time to build a catch record which reflects their vessel's capabilities for purposes of vessel allocations.

2.4.2.2. Negative impacts

The major liability in holding off on allocations for ocean quahogs is revealed in the example that has been set by surf clams: that difficulties in reaching agreement on an allocation formula could bring this management effort to an impasse, and in its place would be a lengthy period of time based management.

2.4.2.3. Net Benefits Relative to Other Alternatives

This alternative is not directly comparable to the others as it does not include any provisions relative to surf clams. It has merit as a means of easing the transition to allocation management for ocean quahogs, but runs the risk of becoming an ingrained feature in the management landscape, and would lead to the severe efficiency losses that have been experienced in the surf clams fishery if not promptly replaced. Because it would constitute merely repeating the surf clam experience, it would be extremely difficult to justify.

2.5. Institute a trip limit system in the Mid-Atlantic surf clam fishery only - Vessel trip limits would be based on either vessel cubic dimensions or best historical trip - Management of ocean quahogs and New England surf clams would remain unchanged

This alternative is the same as the regime currently in effect except that the hourly limitations in the Mid-Atlantic Area surf clam fishery would be replaced with vessel trip allocations. Vessels may be replaced without limit, but the trip limit will remain the same as that of the retiring vessel.

Two trip limits may be consolidated on one vessel, except that the receiving vessel may only get 60% of the trip limit of the retiring vessel No vessel may have more than two trip limits. The 40% loss would be reallocated to the remaining vessels by NMFS.

Management measures would be:

2.5.1. Permit Requirements

A vessel owner or operator must obtain a permit in order to conduct a directed fishery for surf clams or ocean quahogs within the EEZ or land or transfer to another vessel any surf clams or ocean quahogs or part thereof caught within the EEZ. Vessels taking surf clams or ocean quahogs for personal use are exempt from this requirement.

A vessel is eligible for a permit to harvest surf clams in both the New England and Mid-Atlantic Areas if it meets any of the following criteria:

a. The vessel has landed surf clams in the course of conducting a directed fishery for surf clams between 18 November 1976 and 17 November 1977; or

b. The vessel was under construction for, or was being rerigged for, use in the directed fishery for surf clams on 17 November 1977. For the purpose of this paragraph, "under construction" means that the keel has been laid, and "being rerigged" means physical alteration of the vessel or its gear had begun to transform the vessel into one capable of fishing commercially for surf clams; or

c. The vessel is replacing a vessel which left the surf clam fishery during the moratorium, and both the entering and replaced vessels are owned by the same person.

There are no eligibility restrictions for vessels fishing for surf clams in the New England Area. The New England Area is made up of the Nantucket Shoals and Georges Bank Areas.

There are no eligibility restrictions for vessels fishing for ocean quahogs.

Permit applications are processed by the Regional Director. The application form shall require provision of at least the following information: names, addresses, and telephone numbers of the owner and operator; the name of the vessel; the vessel's US Coast Guard documentation number or State license number; engine and

pump horsepower; home port of the vessel; directed fishery or fisheries; fish hold capacity (in cages or bushels); dredge size; and number of dredges. The vessel owner or operator is required to notify NMFS of any changes of address or physical characteristics of vessels.

There is no fee for the initial permit. A lost or mutilated permit may be replaced at a cost of $25.

A permit is valid only for the vessel for which it is issued.

The permit must be carried, at all times, on board the vessel for which it is issued, and must be maintained in legible condition. The permit, the vessel, its gear, and catch are subject to inspection by any authorized official.

Permits expire when the owner or operator retires the vessel from the fishery (it is a rebuttable presumption that failure to land any surf clams or ocean quahogs for 52 consecutive weeks constitutes retirement from the fishery); when the ownership of the vessel changes; or on 31 December of each year. However, the Regional Director may authorize continuation of a vessel permit for the surf clam fishery if the new owner so requests and the vessel meets the relevant eligibility criteria.

Vessels that establish eligibility to fish in both the Mid-Atlantic and New England Areas need not re-establish such eligibility as part of the annual permit renewal.

Permits may be revoked by the Regional Director for violations of this FMP.

2.5.2. Trip Limit Allocations

Alternative trip limit formulas are presented in Appendix 2.

Fishing will be permitted from 0001 Sunday to 2359 Thursday of each week.

The Regional Director will divide the total fleet catch per trip into the quarterly quota to calculate the number of trips for the quarter. The Regional Director shall issue cage tags coded for each trip to each vessel for each quarter.

The Regional Director, upon advice of the Mid-Atlantic Council, may, at any time, issue tags two times a year or once a year, instead of quarterly.

2.5.3. Nantucket Shoals and Georges Bank Areas Surf Clams and Ocean Quahogs

2.5.3.1. Surf Clams - Nantucket Shoals Area

In the Nantucket Shoals Area, no catch restrictions shall be applied to the fishery until 50% of the quarterly quota has been landed. The Regional Director will monitor landings from the Nantucket Shoals Area and will determine either when the 50% point has been reached or when that point will likely be reached. The Regional Director will thereupon consult with the Councils in the selection of trip limits to control catch adequately to keep the fishery open for the balance of the quarter. Trip limits will be established by vessel class as follows: for Class 1 vessels, trip limits may not be less than 224 bu/trip; for Class 2 vessels, trip limits may not be less than 416 bu/trip for Class 2, and for Class 3 vessels, trip limits may not be less than 768 bu/trip. Trip limits must maintain a fixed ratio of 1.0: 1.8: 3.5 for Class 1, 2, and 3, respectively. In the event that trip limits are not sufficient to keep landings to within the quota levels, the Regional Director may close the fishery until the beginning of the next quota period.

Once initial trip limits have been established in consultation with the Councils, the Regional Director will notify the Councils in advance of any proposed action to further specify trip limits or close the fishery. The Regional Director will consider any comments received by the Councils or the public before implementing any adjustments in the Nantucket Shoals management program.

2.5.3.2. Surf Clams - Georges Bank Area

There are no effort restrictions for fishing for surf clams in the Georges Bank Area.

2.5.3.3. Ocean Quahogs

Fishing for ocean quahogs is permitted seven days per week.

When 50% of the quota for ocean quahogs for any time period has been caught, the Regional Director shall determine whether the total catch of ocean quahogs during the applicable time period will exceed the quota for that time period. If the Regional Director determines that the quota probably will be exceeded, he may reduce the number of days per week during which fishing for ocean quahogs is permitted for the remainder

of the time period. The Regional Director shall publish a notice in the *Federal Register* of any reduction in days or week during which fishing for ocean quahogs is permitted. The reduction shall be effective immediately upon publication in the *Federal Register.* The Regional Director shall also send notice of any reduction to each surf clam or ocean quahog processor in the fishery and to each surf clam or ocean quahog vessel owner or operator.

2.5.4. Size restriction

There is a surf clam minimum size limit. After consultation with the Council and opportunity for public comment, the Regional Director shall adjust, by increments no less than 0.25", the surf clam minimum size limit to a value less than 5.5" as necessary, so that discards on average do not exceed 30% of the trip catch. In no event shall the size limit be less than 4.75". When data indicate the clams have grown sufficiently, the limit would be increased, ultimately reaching the 5.5" limit. There is a tolerance of 240 undersized clams per cage but no more than 50 clams per cage under 4.75". If any cage is in violation of the size limit, the entire load is in violation. In adjusting the size limit the Regional Director shall consider current stock assessments, catch reports, and other relevant information concerning the size distribution of the surf clam resource. No person shall harvest or possess surf clams smaller than the minimum size limit.

All surf clams landed on an authorized EEZ fishing day are assumed to have been caught in the EEZ and are subject to the Federal size limit.

2.5.5. Evaluation of Alternative

2.5.5.1. Positive Impacts

The major benefits from this alternative include the removal of time limits on trips, and the ability of aged vessels to be replaced without limit. Total fleet catch would not change since the trip limit remains the same as that of the retiring vessel.

Fleet economic efficiency is improved somewhat by allowing two trip limits to be consolidated on one vessel. However, the receiving vessel may only get 60% of the trip limit of the retiring vessel.

2.5.5.2. Negative Impacts

The limitations placed on vessel replacement and trip consolidation fall short of the efficiency benefits available through a transferable allocation system.

Enforcement considerations may require that fishermen call in the time and place when landing each trip, since there would no longer be a set period of time when vessels can fish.

If the trip limit for some vessels is set lower than their actual (safe) capacity, these vessels would be forced to stop fishing prematurely. Operation of these vessels would become more costly and inefficient, and the industry as a whole would be making more trips for the same annual catch. On the other hand, limits set over safe capacity would lead to vessel safety problems.

An administrative burden is also imposed by continuing split management: different rules for different areas and species.

Finally, since there is no suspension of the size limit provided for in this alternative, the limitation on trip catch could increase incentives for discarding.

2.5.5.3. Net Benefits Relative to Other Alternatives

This alternative was originally conceived as a step wise modification of the current time based system toward an allocation system. Given the fact that a trip limit combined with a limitation on the total number of trips has the effect of creating an annual allocation, this system has evolved into an allocation system with a number of unnecessary limitations packaged into it. For this reason, it cannot be considered favorably when compared to any of the remaining alternatives except for unlimited access and no action.

2.6. Revise current time based system in the Mid-Atlantic surf clam fishery to allow owners of multiple vessels to consolidate their allowable trips on the vessels they currently own, or on to another hull they may acquire

This alternative is the same as the regime currently in effect with some measures revised to reduce governmental involvement and facilitate efficiency in the fishery. Vessel owners would be allowed to consolidate

their allowable trips onto other vessels they own, providing the vessel receiving the permit is of equal or smaller fishing capacity than the vessel from which the permit is removed. Management measures would be:

2.6.1. Permit Requirements

A vessel owner or operator must obtain a permit in order to conduct a directed fishery for surf clams or ocean quahogs within the EEZ or land or transfer to another vessel any surf clams or ocean quahogs or part thereof caught within the EEZ. Vessels taking surf clams or ocean quahogs for personal use are exempt from this requirement.

A vessel is eligible for a permit to harvest surf clams in both the New England and Mid-Atlantic Areas if it meets any of the following criteria:

a. The vessel has landed surf clams in the course of conducting a directed fishery for surf clams between 18 November 1976 and 17 November 1977; or

b. The vessel was under construction for, or was being rerigged for, use in the directed fishery for surf clams on 17 November 1977. For the purpose of this paragraph, "under construction" means that the keel has been laid, and "being rerigged" means physical alteration of the vessel or its gear had begun to transform the vessel into one capable of fishing commercially for surf clams; or

c. The vessel is replacing or has replaced a vessel or vessels which left the surf clam fishery during the moratorium, and both the entering and replaced vessels are owned by the same person. Vessels replacing more than one vessel shall be allowed to fish the allowed trips of all of the vessels replaced (for example, a vessel that replaces three other vessels may fish three times the trips allowed for one vessel).

There are no eligibility restrictions for vessels fishing for surf clams in the New England Area. The New England Area is made up of the Nantucket Shoals and Georges Bank Areas.

There are no eligibility restrictions for vessels fishing for ocean quahogs.

Permit applications are processed by the Regional Director. The application form shall require provision of at least the following information: names, addresses, and telephone numbers of the owner and operator; the name of the vessel; the vessel's US Coast Guard documentation number or State license number; engine and pump horsepower; home port of the vessel; directed fishery or fisheries; fish hold capacity (in cages or bushels); dredge size; and number of dredges. The vessel owner or operator is required to notify NMFS of any changes of address or physical characteristics of vessels.

There is no fee for the initial permit. A lost or mutilated permit may be replaced at a cost of $25.

A permit is valid only for the vessel for which it is issued.

The permit must be carried, at all times, on board the vessel for which it is issued, and must be maintained in legible condition. The permit, the vessel, its gear, and catch are subject to inspection by any authorized official.

Permits expire when the owner or operator retires the vessel from the fishery (it is a rebuttable presumption that failure to land any surf clams or ocean quahogs for 52 consecutive weeks constitutes retirement from the fishery); when the ownership of the vessel changes; or on 31 December of each year. However, the Regional Director may authorize continuation of a vessel permit for the surf clam fishery if the new owner so requests and the vessel meets the relevant eligibility criteria.

Vessels that establish eligibility to fish in both the Mid-Atlantic and New England Areas need not re-establish such eligibility as part of the annual permit renewal.

Permits may be revoked by the Regional Director for violations of this FMP.

2.6.2. Effort restrictions

2.6.2.1. Surf clams - Mid-Atlantic Area

Fishing for surf clams shall be permitted only during the period beginning 6:00 am Sunday and ending 6:00 pm Thursday and be conducted during this period only at the times and under the conditions authorized by the Regional Director. If fishing is permitted for periods of 18 hours, 36 hours, or other time periods that are evenly divisible by 18, the Regional Director may permit fishing beginning at 12:00 am Sunday if, in consultation with the Council, he determines that enforcement resources are adequate to monitor this expanded fishing period. This shall be accomplished by publishing a notice in the *Federal Register*.

Fishing time shall be regulated by the Regional Director to allow fishing for surf clams to be conducted throughout the entire quarter without exceeding the allocation for that quarter and at a rate that will minimize the number of changes to allowed fishing times during the quarter. It is anticipated that the general method of regulating fishing times, both in reopened areas and in the fishery outside of reopened areas, will be regulating the number of trips vessels may make each quarter and the hours per trip each vessel may fish. Vessels shall be required to stop fishing at uniform hours.

The Regional Director shall regulate fishing times for reopened areas to allow fishing for surf clams to be conducted in such areas throughout the entire time period established for each area without exceeding the estimated allowable catch for the area and at a rate that will minimize the number of changes to the allowed fishing times during the quarter. Reopened areas shall be managed with specific estimates of allowable harvest and effort restrictions until the catch per unit of effort in the reopened area equals the general catch per unit of effort in the overall fishery. The Regional Director may designate the maximum number of vessels that may fish in a reopened area at any one time and, if conflicts develop between that number and the fishing periods requested by fishermen, he may select the vessels that fish on particular days by use of a lottery.

If the Regional Director determines during the quarter that the quarterly allocation will be (will not be) exceeded, he may reduce (increase) the number of trips during which fishing for surf clams is permitted to avoid prolonged vessel tie up times and fluctuations in the supply of surf clams which would result if the allocations were taken rapidly during the beginning of each quarter (facilitating the catch of the full quarterly allocation).

The Regional Director shall publish a notice in the *Federal Register* of any reduction or increase in trips during which fishing for surf clams is permitted. The reduction or increase may take effect immediately upon publication in the *Federal Register.* The Regional Director shall also send notice of the change to each surf clam or ocean quahog processor in the fishery and to each surf clam or ocean quahog vessel owner or operator.

If NMFS continues the procedure of requiring surf clam fishermen to specify their fishing days, provision is made for an alternate fishing day in the event of unsafe weather conditions on the specified day. A fisherman may claim a weather day if the fisherman notifies the appropriate official designated by NMFS of his intent to claim a weather day within four hours of his official starting time for fishing and if he lands no clams on that day. This make up day shall be the next fishing day and shall amount to the same number of hours as the fisherman normally has on a fishing day. A fisherman will not be permitted to claim an additional make up day if weather conditions prohibited fishing on a make up day. This make up day provision shall be in effect only for the months of November, December, January, February, March, and April.

In addition to the effort restrictions in the current FMP presented above, surf clam vessels may land surf clams only one time during an authorized time period.

2.6.2.2 . Surf Clams - Nantucket Shoals Area

In the Nantucket Shoals Area, no catch restrictions shall be applied to the fishery until 50% of the quarterly quota has been landed. The Regional Director will monitor landings from the Nantucket Shoals Area and will determine either when the 50% point has been reached or when that point will likely be reached. The Regional Director will thereupon consult with the Councils in the selection of trip limits to control catch adequately to keep the fishery open for the balance of the quarter. Trip limits will be established by vessel class as follows: for Class 1 vessels, trip limits may not be less than 224 bu/trip; for Class 2 vessels, trip limits may not be less than 416 bu/trip for Class 2, and for Class 3 vessels, trip limits may not be less than 768 bu/trip. Trip limits must maintain a fixed ratio of 1.0: 1.8: 3.5 for Class 1, 2, and 3, respectively. In the event that trip limits are not sufficient to keep landings to within the quota levels, the Regional Director may close the fishery until the beginning of the next quota period.

Once initial trip limits have been established in consultation with the Councils, the Regional Director will notify the Councils in advance of any proposed action to further specify trip limits or close the fishery. The Regional Director will consider any comments received by the Councils or the public before implementing any adjustments in the Nantucket Shoals management program.

2.6.2.3. Surf Clams - Georges Bank Area

There are no effort restrictions for fishing for surf clams in the Georges Bank Area.

2.6.2.4. Ocean Quahogs

Fishing for ocean quahogs is permitted seven days per week.

When 50% of the quota for ocean quahogs for any time period has been caught, the Regional Director shall determine whether the total catch of ocean quahogs during the applicable time period will exceed the quota for that time period. If the Regional Director determines that the quota probably will be exceeded, he may reduce the number of days per week during which fishing for ocean quahogs is permitted for the remainder of the time period. The Regional Director shall publish a notice in the *Federal Register* of any reduction in days or week during which fishing for ocean quahogs is permitted. The reduction shall be effective immediately upon publication in the *Federal Register*. The Regional Director shall also send notice of any reduction to each surf clam or ocean quahog processor in the fishery and to each surf clam or ocean quahog vessel owner or operator.

2.6.3. Size restriction

There is a surf clam minimum size limit. After consultation with the Council and opportunity for public comment, the Regional Director shall adjust, by increments no less than 0.25", the surf clam minimum size limit to a value less than 5.5" as necessary, so that discards on average do not exceed 30% of the trip catch. In no event shall the size limit be less than 4.75". When data indicate the clams have grown sufficiently, the limit would be increased, ultimately reaching the 5.5" limit. There is a tolerance of 240 undersized clams per cage but no more than 50 clams per cage under 4.75". If any cage is in violation of the size limit, the entire load is in violation. In adjusting the size limit the Regional Director shall consider current stock assessments, catch reports, and other relevant information concerning the size distribution of the surf clam resource. No person shall harvest or possess surf clams smaller than the minimum size limit.

All surf clams landed on an authorized EEZ fishing day are assumed to have been caught in the EEZ and are subject to the Federal size limit.

2.6.4. Evaluation of Alternative

2.6.4.1. Positive Impacts

The major benefits of this alternative derive from its being a compromise position between the current system and one utilizing transferable allocations. Efficiency is improved by allowing owners of multiple vessels to consolidate trips on to fewer vessels, and the controversial issue of making initial allocations is postponed to a later date when it is expected that the number of principals concerned will have been reduced, and the problem made more tractable.

The problem of vessel safety from an aging fleet is addressed in that vessel owners will be able to move their allowable trips off of decaying vessels and on to more seaworthy, efficient hulls.

2.6.4.2. Negative Impacts

The time based limitations on fishermen's actions would remain in place with this alternative, and efficiency benefits limited by a requirement that the vessel receiving another's trips be of the same or smaller size.

Owners of only one boat may be disadvantaged by not having the ability to consolidate trips unless they form a partnership with another owner.

An administrative burden is also imposed by continuing split management: different rules for different areas and species.

Consolidation of permits may lead to a more inefficient fleet due to the necessity of requiring equal or less fishing power for combinations.

2.6.4.3. Net Benefits Relative to Other Alternatives

The net benefits of this alternative are considered to be on a middle level: not as advantageous as an allocation system, but a substantial improvement over the current system or open access.

APPENDIX 2. ALTERNATIVE INITIAL ALLOCATION FORMULAS

1. INTRODUCTION

1.1. General

The Amendment includes a number of management alternatives that are based on allocating the annual quota for surf clams (both coastwide and for the Mid-Atlantic Area only), ocean quahogs, or both to individual vessels. There is also an alternative to establish trip limits by allocating to each vessel the quantity the vessel may land on each trip. Within each set of allocation alternatives there are almost countless ways of making the initial allocations. This Appendix contains the allocation formulas considered by the Council for this Amendment, along with an evaluation of the distributive effects of each formula.

These formulas may be applied to surf clams, ocean quahogs, or both, and may be applied to the Mid-Atlantic Area for only surf clams or for the entire management area for surf clams, ocean quahogs, or both. The species and geographical area to be included are specified in the individual alternatives as set forth in Section 9.1 of the adopted FMP and Appendix 1.

The Amendment includes alternatives that allocate shares of the quota directly to vessels. One method of calculating these allocations is the share of the total catch accounted for by each vessel. In order to make this issue as unambiguous as possible it is necessary to specify several attributes of such a system. In the hearing draft these aere:

1. Vessel logbook records will be used to calculate the catch.
2. Logbook records prior to 1979 were not edited to the extent necessary to use them for this purpose.
3. There must be a cut off date so that future performance does not effect allocations. 31 December 1987 was used as the cut off for the hearing draft of this Amendment, which is incorporated in the formulas and analyses in this Appendix.

Based on the hearing and comment process, the decision was made to extend the period through 31 December 1988 (section 9 of the adopted FMP).

The distributive effects of the various allocation formulas are summarized in this part. For a more complete accounting of the costs and benefits of a particular allocation scheme as applied to its associated management alternative, refer to Section 9.2 or Appendix 1.

Each of the allocation formulas considered by the Council is evaluated relative to two comparative base lines: long term (1979-87) share of landings and recent (1985-87) share of landings. The rationale for these two evaluations stems from the nature of the fishery under the Mid-Atlantic Area moratorium. As noted above, based on hearing comments, the base line was changed to 1979-1988 in the final FMP.

The original Surf Clam and Ocean Quahog FMP (MAFMC, 1977) established a moratorium on new entrants to the surf clam fishery. Amendment 2 divided the management unit into the Mid-Atlantic and New England Areas, with no moratorium in New England. The ocean quahog fishery has always remained open to new entrants. The moratorium was intended by the Council to be a transitional step to some form of allocation system. Unfortunately, a feasible allocation scheme could not be developed in such a short time frame and the fishery has operated under the moratorium continuously to the present.

Use of logbook records for the determination of historical shares of the catch has been complicated by the fact that ownership transfer of moratorium vessels, including the associated permit, has been allowed under the FMP (Section 7.5.2). Many individual participants have changed over time and moratorium permits have thus acquired a capitalized value which is reflected in the sale price of vessels. Recent purchasers of vessels will resist any allocation scheme which restricts their ability to recover capital outlays. Additionally, some participants feel that catch records have been unduly influenced by market concentration in the processing sector or they were unable to fish due to equipment problems. These participants contend that use of catch records will perpetuate an inequitable distribution of the resource. In response to such concerns, the cubic measure of the vessel has been put forth as a basis for allocation which, presumably, is related to harvesting capacity and therefore is a measure of dependence on the fishery.

In order to assess the differential impacts of the allocation formulas on both long term participants and more recent entrants, the two historical base lines were chosen. Each of the base lines has its merits and embodies contentious issues, making it difficult to determine whether either is more fair and equitable. Nonetheless,

the relative (percent) change in quota share from the shares actually taken by each vessel over the two periods (1979-87 and 1985-87) are evaluated for each allocation formula (Appendix Table 2.1).

It should be noted that a percentage loss in catch share or bushel allocation is not necessarily an economic loss for an individual vessel when viewed in the context of the entire allocation program. Those with a loss in surf clam share may gain in ocean quahogs. Additionally, cost savings from consolidation and transfer of catch to more efficient vessels may more than compensate for any loss in catch share. In all likelihood, the fleet as a whole will show gains in net income (FMP section 9.2.2.2.2.), though it is possible that some individual vessels will be negatively impacted by the direct allocation of shares.

It should also be noted that, since allocations are on a percentage basis, actual annual bushel allocations will vary over time as the annual quota is adjusted for conservation purposes. These future distributive effects, whether positive or negative, are not directly attributable to the allocation program and must not be viewed as such.

Trips limits do not directly allocate shares of the quota to individual vessels, but indirectly, they would function in an identical manner. Effort control under a trip limit system would remain the same as the current time based system in that the Regional Director would set a fixed number of trips per quarter to keep catch in line with quarterly quotas. Assuming every vessel catches its limit, and most are likely to do so since the six hour trip restriction would be dropped, it is obvious that multiplying the trip limit by the number of annually allowed trips results in an allocation. In addition to the distributive effects similar to the direct allocation formulas, the effects of the various formulas on the number of allowable trips are evaluated.

1.2. Phase In

The preferred alternative in the hearing draft included the provision of a three year (FMP section 9.1.2) period during which surf clam vessels could be combined on a 2 for 1 basis each year. Individual surf clam allocations and individual surf clam quotas would be coupled to the vessels during this three year period. Beginning with the fourth year individual surf clam allocations and individual surf clam quotas could be traded freely (in quantities no smaller than 5 cages). There is no phase in proposed for ocean quahogs, so individual ocean quahog allocations and individual ocean quahog quotas could be traded freely (in quantities no smaller than 5 cages) as of the first day the Amendment is in effect.

Clearly, the allocation formulas in this Appendix could be implemented with a phase in and the formulas in the preferred section of the Amendment (FMP section 9.1.2.4) could be implemented without a phase in.

The Council sought comment on this issue. The concept was not included in the adopted FMP.

1.3. Vessel allocation Formulas in Hearing Draft Preferred Alternative

The preferred alternative in the hearing draft of Amendment #8 provided for vessel allocations of both surf clams and ocean quahogs throughout the management unit. a series of allocation formulas were presented. One of those formulas, slightly modified, was selected for surf clams and another, slightly modified, was selected for ocean quahogs. The selected formulas are discussed in FMP section 9.1 of the Amendment. In order that the record is complete, the following section is a reproduction of the formula discussion and evaluation sections from the hearing draft, with only section numbers changed to conform with the format of this Appendix.

1.3.1. General

The basic instrument (individual allocation) for allocating both surf clams and ocean quahogs will be denominated as a percentage of the total annual quota. Each year, owners of individual allocations will be issued cage tags which will allow them to harvest a given number of cages based on their percentage share. Allocations are on a percentage basis so that the amount of the allocation varies as the total quota varies from year to year. Surf clams and ocean quahogs may not be landed without appropriate tags attached to all cages containing clams or quahogs.

For surf clams the Council staff recommended allocation formula #3 (Adjusted History) as the most appropriate and justifiable formula and also stated that formulas #1 (Historical Participation) and #2 (Weighted History) could possibly meet the standards and guidelines of the MFCMA, although not as well as formula #3. The staff further advised the Council that they did not believe that formulas #4 (Adjusted History or Adjusted Cubic) or #5 (Vessel Cubic Dimensions) met the tests set forth in the standards and guidelines of the MFCMA.

For ocean quahogs the Council staff recommended allocation formula #4 (Average of the Years Fished) as the most appropriate and justifiable formula. Formulas #1 (Historical Participation) and #2 (Weighted History) could possibly meet the standards and guidelines of the MFCMA, although not as well as formula #4. The staff does not believe that formula #3 (Vessel Cubic Dimensions) meets the tests set forth in the standards and guidelines of the MFCMA.

While the Council selected the allocation of both surf clams and ocean quahogs coastwide as the preferred alternative for this Amendment, the Council did not select a formula by which initial allocations would be made. Rather, five formulas have been identified for surf clams and four formulas have been identified for ocean quahogs. The Council is seeking comment on these alternative formulas through the review and hearing process.

1.3.2. Surf clam allocations

Five formulas were specified for allocating surf clams coastwide (that is, the New England and Mid-Atlantic Areas combined) pursuant to the preferred alternative. For all formulas, permitted vessels which harvested surf clams (based on logbook reports) between 1 January 1979 and 31 December 1987 are eligible for an initial allocation. The formulas are:

1.3.2.1. **Historical Participation.** The initial distribution will be based on the percentage of the total catch of surf clams that the particular vessel caught (based on logbook reports) during the 1 January 1979 - 31 December 1987 period. For purposes of calculating historical participation, vessels that have replaced other vessels will be credited with the catch of the vessels they replaced.

1.3.2.2. **Weighted History.** The initial distribution will be based on the percentage of the total catch of surf clams that the particular vessel caught (based on logbook reports) during the 1 January 1979 - 31 December 1987 period with 1985, 1986, and 1987 counted twice and the 2 worst years dropped. The result is calculated for each vessel and then summed for the fleet. Each vessel's sum divided into the fleet total to obtain the vessel's share. For purposes of calculating historical participation, vessels that have replaced other vessels will be credited with the catch of the vessels they replaced.

1.3.2.3. **Adjusted History.** For vessels with permits to fish for surf clams and ocean quahogs in any Area (that is, vessels with permits issued pursuant to the moratorium; permits designated by NMFS as SF-1) the initial surf clam distribution would be based on the following formula:

a. The surf clam catch (in bushels) that each permitted vessel caught (based on logbook reports) for calendar years 1979, 1980, 1981, 1982, 1983, 1984, 1985 (counted twice), 1986 (counted twice), and 1987 (counted twice) would be determined. This would result in 12 years of data (remember 1985, 1986, and 1987 are counted twice).

b. The worst two years would be deleted from each vessel's history. The resulting number (in bushels) would be summed for the entire fleet and each vessel's ratio of the total calculated.

c. The cost factor (vessel length x width x depth) of each vessel would be calculated, summed for the fleet, and each vessel's ratio to the total calculated. The vessel's historical ratio would contribute 90% to the vessel's initial allocation. The cost factor would contribute 10% to the vessel's initial allocation.

For vessels with permits to fish for surf clams in only the New England Area (permits designated by NMFS as SF-7) the surf clam catch would be the average of the catch for the years actually fished between 1979 and 1987, inclusive. This number (in bushels) would be included in the total for the total surf clam fleet (moratorium and New England Area only) to calculate the individual vessel's ratios. They would then be included with the moratorium vessels in the above allocation. For purposes of calculating historical participation, vessels that have replaced other vessels will be credited with the catch of the vessels they replaced.

1.3.2.4. **Based on Adjusted History or Adjusted Cubic.** The initial distribution will be based either on:

a. 90% on the percentage of the total catch of surf clams that the particular vessel caught (based on logbook reports) during the 1 January 1979 - 31 December 1987 period with 1985, 1986, and 1987 counted twice and the 2 worst years dropped and 10% on the percentage of the total volume (length x width x depth) of all permitted vessels that the particular vessel's volume represents,

or;

b. 10% on the percentage of the total catch of surf clams that the particular vessel caught (based on logbook reports) during the 1 January 1979 - 31 December 1987 period with 1985, 1986, and 1987 counted twice and the 2 worst years dropped and 90% on the percentage of the total volume (length × width × depth) of all permitted vessels that the particular vessel's volume represents, whichever is best for the vessel.

Adjustments necessary to rationalize the fleet total allocation with the quota will be made. For purposes of calculating historical participation, vessels that have replaced other vessels will be credited with the catch of the vessels they replaced.

1.3.2.5. **Allocations Based on Vessel Cubic Dimensions.** The initial distribution will be based on the percentage of the total volume (length × width × depth) of all permitted vessels that the particular vessel's volume represents.

1.3.3. Ocean quahog allocations

Four formulas were specified for allocating ocean quahogs coastwide pursuant to the preferred alternative. For all formulas, permitted vessels which harvested ocean quahogs (based on logbook reports) between 1 January 1979 and 31 December 1987 are eligible for an initial allocation. The formulas are:

1.3.3.1. **Allocations Based on Historical Participation.** The initial distribution will be based on the percentage of the total catch of ocean quahogs that the particular vessel caught (based on logbook reports) during the 1 January 1979 - 31 December 1987 period. For purposes of calculating historical participation, vessels that have replaced other vessels will be credited with the catch of the vessels they replaced.

1.3.3.2. **Based on Weighted History.** The initial distribution will be based on the percentage of the total catch of Mid-Atlantic Area surf clams that the particular vessel caught (based on logbook reports) during the 1 January 1979 - 31 December 1987 period with 1985, 1986, and 1987 counted twice and the 2 worst years dropped. The result is calculated for each vessel and then summed for the fleet. Each vessel's sum divided into the fleet total to obtain the vessel's share. For purposes of calculating historical participation, vessels that have replaced other vessels will be credited with the catch of the vessels they replaced.

1.3.3.3. **Allocations Based on Vessel Cubic Dimensions.** The initial distribution will be based on the percentage of the total volume (length × width × depth) of all permitted vessels which have recorded logbook landings of ocean quahogs that the particular vessel's volume represents.

1.3.3.4. **Average of Years Fished.** For vessels with permits to fish for ocean quahogs (permits designated by NMFS as SF-7) the initial ocean quahog distribution would be based on the following formula:

a. The average ocean quahog catch (in bushels) that each permitted vessel caught (based on logbook reports) for those years the vessel actually reported landings for calendar years 1979 through 1987 would be determined.

b. The sum of all of the vessels' averages would be divided into each vessel's average to calculate each vessel's ratio of the total.

c. The ratio would be applied to each year's annual quota to calculate each vessel's annual allocation.

1.3.4. Evaluation of Formulas for Initial Annual Allocation of Surf Clams Coastwide

The distributive effects of the various allocation formulas are summarized in this section.

Each of the allocation formulas considered by the Council is evaluated relative to two comparative base lines: long term (1979-87) share of landings and recent (1985-87) share of landings. The rationale for these two evaluations stems from the nature of the fishery under the Mid-Atlantic Area moratorium.

The original Surf Clam and Ocean Quahog FMP (MAFMC, 1977) established a moratorium on new entrants to the surf clam fishery. Amendment 2 divided the management unit into the Mid-Atlantic and New England Areas, with no moratorium in New England. The ocean quahog fishery has always remained open to new entrants. The moratorium was intended by the Council to be a transitional step to some form of allocation system. Unfortunately, a feasible allocation scheme could not be developed in such a short time frame and the fishery has operated under the moratorium continuously to the present.

Use of logbook records for the determination of historical shares of the catch has been complicated by the fact that ownership transfer of moratorium vessels, including the associated permit, has been allowed under the FMP (Section 7.5.2). Many individual participants have changed over time and moratorium permits have thus acquired a capitalized value which is reflected in the sale price of vessels. Recent purchasers of vessels will resist any allocation scheme which restricts their ability to recover capital outlays. Additionally, some participants feel that catch records have been unduly influenced by market concentration in the processing sector or are not representative because they were unable to fish due to equipment problems. These participants contend that use of catch records will perpetuate an inequitable distribution of the resource. In response to such concerns, the cubic measure of the vessel has been put forth as a basis for allocation which, presumably, is related to harvesting capacity and therefore is a measure of dependence on the fishery.

In order to assess the differential impacts of the allocation formulas on both long term participants and more recent entrants, the two historical base lines were chosen. Each of the base lines has its merits and embodies contentious issues, making it difficult to determine whether either is more fair and equitable. Nonetheless, the relative (percent) change in quota share from the shares actually taken by each vessel over the two periods (1979-87 and 1985-87) are evaluated for each allocation formula (Appendix Table 2.5).

It should be noted that a percentage loss in catch share or bushel allocation is not necessarily an economic loss for an individual vessel when viewed in the context of the entire allocation program. Those with a loss in surf clam share may gain in ocean quahogs. Additionally, cost savings from consolidation and transfer of catch to more efficient vessels may more than compensate for any loss in catch share (for example, given the estimated $147,400 average class 3 fixed cost and the 1987 price of $8.01/bushel for surf clams, consolidation of two class 3 vessels on one saves the equivalent of 18,402 bushels of clams). In all likelihood, the fleet as a whole will show gains in net income (FMP section 9.2.2.1.2.), though it is possible that some individual vessels will be negatively impacted by the direct allocation of shares.

It should also be noted that, since allocations are on a percentage basis, actual annual bushel allocations will vary over time as the annual quota is adjusted for conservation purposes. These future distributive effects, whether positive or negative, are not directly attributable to the allocation program and must not be viewed as such.

1.3.4.1. Surf Clam Allocations Based on Historical Participation

This allocation formula is identical to the long term historical baseline. Allocations directly reflect actual performance in terms of average catch over the 1979-87 period. Since the quota has been increasing over the last nine years, all deviations from long term average are positive. Essentially, shares in earlier years were established under a lower total and are now multiplied by a larger total. The minimum gain in terms of percent change in bushels is 29%, the maximum is 40% and both mean and median are 31% (Appendix Table 2.2). There is essentially no redistribution from long term catch share (Appendix Table 2.3).

When compared to the short term baseline, however, some redistribution of catch share is evident. Considering the percent change in bushels, the maximum deviation from the baseline is an increase of 244% and the minimum is a loss of 57% (Appendix Table 2.2). Both the mean and median are small, 1% and 3% respectively, indicating that this allocation formula redistributes a small portion of the shares of many recent strong performers to a lesser number of long term participants. The largest absolute decrease is about 36,000 bushels (Appendix Table 2.3), indicating that recent catch histories for some vessels have improved markedly over the long term base line.

1.3.4.2. Surf Clam Allocations Based on Weighted History

Since this allocation formula makes full use of the long term historical baseline, there is little deviation from this baseline. When considering the allocation of all surf clams, the maximum increase in catch relative to long term average amounts to 96%, while the minimum is a loss of 6% (Appendix Table 2.2). Both the mean and median are positive indicating more gainers than losers. Weighting performance towards the present and dropping the two worst years shifts some catch share away from long term steady performers to participants with less consistent catch histories or improving recent performance. The spread between the largest gainers and losers in terms of bushels is increased slightly over that of unweighted history (Appendix Table 2.3).

When compared to the short term base line, redistribution is similar to that for straight history (Appendix Tables 202 and 2.3), although the spread between the largest gainer and loser has been decreased by weighting toward more recent performance.

1.3.4.3. Surf Clam Allocations Based on Adjusted History

Catch share in the future should reflect the effort expended by the individual fisherman in the past while each has had an equal opportunity to participate. It should be noted that the trip limits originally recommended by the Regional Director for the initial Surf clam/Ocean quahog FMP were rejected on grounds that they resulted in too great a redistribution of historical catch share and could not be justified based on the limited data on vessel class performance available at the time. Since then, a more complete and accurate picture of participation has become available through the logbook system and the staff believes this data should serve as the primary basis for allocation.

The distributive effects of this allocation formula are almost entirely positive when compared to long term average catch. The maximum deviation is an increase of 12,820% and the minimum is a loss of 2% (Appendix Table 2.2). Both the mean and median are positive, 180% and 35% respectively, indicating that this allocation formula redistributes a small portion of the shares from a very few long term strong performers to a few marginal participants. Although the relative increase to some vessels is extremely large, the actual amount in bushels is much less (Appendix Table 2.3). This is because a few vessels have infrequently fished to capacity and are being awarded some of the share of large vessels with consistently large catches.

When compared to the short term baseline, the maximum deviation is an increase of 200% and the minimum is a loss of 37% (Appendix Table 2.2). The median is 5%, indicating that this allocation formula redistributes a small portion of the shares of few long term strong performers to a few participants whose recent catches were better than in the past and are currently fishing closer to vessel capacity. Compared to the short term baseline, redistribution is more moderate under this allocation formula than for the formula incorporating only catch histories. Though the range of redistribution exceeds that of weighted history to a very small extent, the intention is to account to a larger degree for dependence on the fishery. Note that redistribution is not as great in terms of absolute market share (ratio) (Appendix Table 2.3) as it is in relative change in bushels (Appendix Table 2.2). Since most surf clam vessels cannot readily shift into other fisheries, it was felt that additional emphasis on current investment was warranted. The Council believes these adjustments made to long term history were necessary to more accurately reflect present participation and dependence (section 9.2).

1.3.4.4. Surf Clam Allocations Based on Adjusted History or Adjusted Cubic

When compared to the long term baseline, the maximum deviation is an increase of over 100,000% and the minimum is a loss of 217% (Appendix Table 2.2). The median is 24%, indicating that this allocation formula redistributes a small portion of the shares from a few long term strong performers to a few participants whose vessels did not normally fish to capacity as measured by the cubic method. Although the relative increase to some vessels is extremely large, the actual amount in bushels is much less (Appendix Table 2.3). This is because a few large vessels have not fished to capacity and are being awarded some of the share of large vessels with consistently large catches.

When compared to the short term baseline, the maximum deviation is an increase of 459% and the minimum is a loss of 46% (Appendix Table 2.2). The median is -1%, indicating that this allocation formula redistributes a small portion of the shares of many recent strong performers to a few long term participants. This is most evident when comparing the absolute difference in bushels (Appendix Table 2.3), which is skewed downward for the short term base line. The reason for the difference from the long term baseline is again due to the formula's cubic component; catch rates of most vessels have increased in recent years, reflecting the capacity of the vessel to a greater extent than before.

1.3.4.5. Surf Clam Allocations Based on Vessel Cubic Dimensions

This formula has been put forth by certain participants in the harvesting sector as a means of assessing dependence on the fishery. Presumably, vessel size is related to harvesting capacity and the level of investment in the fishery, though the exact relationships are not clear from available data.

Since this allocation formula is independent of historical performance, there are deviations from both base lines. When compared to the long term baseline, the maximum deviation is an increase of over 130,000% and the minimum is a loss of 53% (Appendix Table 2.2). Both the mean and median are positive, 1,281% and 41% respectively, indicating that this allocation formula redistributes a small portion of the shares from a few long term strong performers to a larger number of marginal participants. Although the relative increase to some vessels is extremely large, the actual amount in bushels is much less (Appendix Table 2.3). This is

because a few large vessels have not fished to capacity or have hardly fished at all, and are being awarded some of the share of large vessels with consistently large catches.

When compared to the short term baseline, the maximum deviation is an increase of 854% and the minimum is a loss of 68% (Appendix Table 2.2). The median is -2%, indicating that this allocation formula redistributes to a lesser extent a small portion of the shares of many recent strong performers to a few long term participants. The absolute difference in bushels is again skewed downward for the short term base line (Appendix Table 2.3). The reason for the difference from the long term baseline is that catch rates of most vessels have increased in recent years, reflecting the capacity of the vessel to a greater extent than before.

1.3.4.6. Ocean Quahog Allocations Based on Historical Participation

This allocation formula is identical to the long term historical baseline. Allocations directly reflect actual performance in terms of average catch over the 1979-87 period. Since the quota has been increasing over the last nine years, all deviations from long term average are positive. Essentially, shares in earlier years were established under a lower total and are now multiplied by a larger total. The minimum gain in terms of percent change in bushels is 61%, the maximum is 72% and both mean and median are 66% (Appendix Table 2.2). While there is essentially no redistribution from long term absolute catch share, it is evident that long term participants lose to recent entrants when applying the shore term base line (Appendix Table 2.4).

The maximum deviation from short term average is an increase of 1,454% and the minimum is a loss of 46%. The median is negative, indicating that more than half of the vessels would lose with this allocation formula relative to recent performance. The greater dispersion of redistribution in terms of absolute bushels (Appendix Table 2.4) is evidence of the inconsistent participation in the fishery.

1.3.4.7. Ocean Quahog Allocations Based on Weighted History

The maximum increase in catch relative to long term average amounts to 147%, while the minimum is a a gain of 22% (Appendix Table 2.2). Both the mean and median are positive indicating more gainers than losers. Weighting performance towards the present and dropping the two worst years shifts some catch share away from long term steady performers to participants with less consistent catch histories or improving recent performance.

The maximum increase in catch relative to short term average amounts to 1,096%, while the minimum is a a loss of 18% (Appendix Table 2.2). Both the mean and median are positive indicating more gainers than losers. The redistribution in terms of absolute bushels is less for weighted history than for straight history (Appendix Table 2.4), indicating that more recent performance has been more consistent.

1.3.4.8. Ocean Quahog Allocations Based on Vessel Cubic Dimensions

This formula has been put forth by certain participants in the harvesting sector as a means of assessing dependence on the fishery. Presumably, vessel size is related to harvesting capacity and the level of investment in the fishery, though the exact relationships are not clear from available data.

Since this allocation formula is independent of historical performance, there are deviations from both base lines. When compared to the long term baseline, the maximum deviation is an increase of over 240,000% and the minimum is a loss of 68% (Appendix Table 2.2). Both the mean and median are positive, 12,009% and 392% respectively, indicating that this allocation formula redistributes a small portion of the shares from a few long term strong performers to a larger number of marginal participants. Although the relative increase to some vessels is extremely large, the actual amount in bushels is much less (Appendix Table 2.4). This is because a few large vessels have not fished to capacity or have hardly fished at all, and are being awarded some of the share of large vessels with consistently large catches.

When compared to the short term baseline, the maximum deviation is an increase of 40,547% and the minimum is a loss of 70% (Appendix Table 2.2). The median is 69%, indicating that this allocation formula redistributes to a lesser extent a small portion of the shares of many recent strong performers to a few long term participants. The reason for the difference from the long term baseline is that catch rates of most vessels have increased in recent years, reflecting the capacity of the vessel to a greater extent than before. Dispersion of the redistribution in terms of absolute bushels is skewed downward for the short term (Appendix Table 2.4), again reflecting improving recent performance.

1.3.4.9. Ocean Quahog Allocations Based on the Average of Years Fished

This formula applies only to ocean quahogs under the preferred alternative (FMP section 9.1.2.3.2.) and was developed because the circumstances which apply to this sector of the fishery are distinct from surf clams in

that the quahog fishery would operate under a controlled system for the first time. All participants have not been on an equal footing over the nine year history since entry or re-entry has been legal at any time. For example, utilizing a nine year average for a first time participant in 1987 would unfairly bias catch records downward. Averaging catches over the years actually fished results in no redistribution from an individual perspective. Since each participant's base line is obviously dependent on the number of years fished, it is inappropriate to evaluate this allocation formula against long or short term history as above, although it is evident that all deviations from long term history are positive (Appendix Table 2.2).

2. FORMULAS FOR INITIAL ANNUAL ALLOCATION OF MID-ATLANTIC AREA SURF CLAMS

2.1. Allocations Based on Historical Participation

Permitted vessels which harvested surf clams in the Mid-Atlantic Area (based on logbook reports) between 1 January 1979 and 31 December 1987 are eligible for an initial allocation.

The initial distribution will be based on the percentage of the total catch of Mid-Atlantic Area surf clams that the particular vessel caught (based on logbook reports) during the 1 January 1979 - 31 December 1987 period.

For purposes of calculating historical participation, vessels that have replaced other vessels will be credited with the catch of the vessels they replaced.

Since this allocation formula is identical to the long term historical baseline, there is little deviation from it. Allocations directly reflect actual performance in terms of average catch over the 1979-87 period. Since the quota has been increasing over the last nine years, all deviations from long term average are positive. Essentially, shares in earlier years were established under a lower total and are now multiplied by a larger total. The minimum gain in terms of percent change in bushels is 18%, the maximum is 20% and both mean and median are 19% (Appendix Table 2.1). There is essentially no redistribution in terms of catch share (Appendix Table 2.2).

When compared to the short term baseline, however, some redistribution of catch share is evident. The maximum deviation is an increase of 212% and the minimum is a loss of 60% (Appendix Table 2.1). The mean and median are 1% and -1% respectively, indicating that more than half of the vessels would lose relative to their recent catch with this allocation formula. The redistribution relative to recent performance is more clearly seen by examining the absolute change in bushels (Appendix Table 2.2).

2.2. Based on Weighted History

Permitted vessels which harvested surf clams in the Mid-Atlantic Area (based on logbook reports) between 1 January 1979 and 31 December 1987 are eligible for an initial allocation.

The initial distribution will be based on the percentage of the total catch of Mid-Atlantic Area surf clams that the particular vessel caught (based on logbook reports) during the 1 January 1979 - 31 December 1987 period with 1985, 1986, and 1987 counted twice and the 2 worst years dropped. The result is calculated for each vessel, summed for the fleet; each vessel's sum divided into the fleet total to obtain the vessel's share.

For purposes of calculating historical participation, vessels that have replaced other vessels will be credited with the catch of the vessels they replaced.

Since this allocation formula makes full use of the long term historical baseline, there is little deviation from it. The maximum increase in catch relative to long term average amounts to 26%, while the minimum is a loss of -12% (Appendix Table 2.1). Both the mean and median are positive indicating more gainers than losers. Weighting performance towards the present and dropping the two worst years shifts some catch share away from long term steady performers to participants with less consistent catch histories or improving recent performance. The absolute change in bushels is positive for most vessels (Appendix Table 2.2)

Relative to short term history, the largest gain in bushels is 169%, while the largest loss is 40%. Since the median is negative, more than half of the vessels in the Mid-Atlantic fleet would lose with this formula relative to their recent performance (Appendix Table 2.1). The absolute change in bushels indicates greater redistribution relative to 1985-87 average catch (Appendix Table 2.2).

2.3. Allocations Based on Vessel Cubic Dimensions

Permitted vessels in the Mid-Atlantic Area surf clam fishery are eligible for an initial allocation.

The initial distribution will be based on the percentage of the total volume (length x width x depth) of all permitted vessels that the particular vessel's volume represents.

This formula has been put forth by certain participants in the harvesting sector as a means of assessing dependence on the fishery. Presumably, vessel size is related to harvesting capacity and the level of investment in the fishery, though the exact relationships are not clear from available data.

Since this allocation formula is independent of historical performance, there are deviations from both base lines. When compared to the long term baseline, the maximum deviation is an increase of almost 120,000% and the minimum is a loss of 58% (Appendix Table 2.1). Both the mean and median are positive, 1,552% and 18% respectively, indicating that this allocation formula redistributes a small portion of the shares from a few long term strong performers to a larger number of marginal participants. Although the relative increase to some vessels is extremely large, the actual amount in bushels is much less (Appendix Table 2.2). This is because a few large vessels have not fished to capacity or have hardly fished at all, and are being awarded some of the share of large vessels with consistently large catches. This is indicated by the large spread between gainers and losers in terms of absolute bushels (Appendix Table 2.2).

When compared to the short term baseline, the maximum deviation is an increase of 1,442% and the minimum is a loss of 52% (Appendix Table 2.1). The median is -11%, indicating that this allocation formula redistributes to a lesser extent a small portion of the shares of many recent strong performers to a few long term participants. The reason for the difference from the long term baseline is that catch rates of most vessels have increased in recent years, reflecting the capacity of the vessel to a greater extent than before. The lower extremes of redistribution of absolute bushels is indicative of this (Appendix Table 2.2).

2.4. Allocations Based on a Vessel's Best Trip

Permitted vessels which harvested Mid-Atlantic area surf clams (based on logbook reports) between 1 January 1979 - 31 December 1987 are eligible for an initial allocation.

The initial distribution will be based on the percentage of the total of best trip catches of all vessels of Mid-Atlantic Area surf clams that the particular vessel caught on its individual best trip (based on logbook reports) during the 1 January 1979 - 31 December 1987 period.

For purposes of calculating the best trip, vessels that have replaced other vessels will be credited with the catch of the vessels they replaced.

One of the problems with using best trip is that in some instances, the best trip as calculated from logbooks may greatly exceed the safe loading capacity of the vessel. This is in part due to the fact that the best single trip in some cases has been a deliberate overloading of the vessel (comments from fishermen at Amendment 7 hearings). Also, in large part, the best trip is an artifact of the recordkeeping system in that it was possible for some vessels to make two Mid-Atlantic surf clam trips per day during the early years of the time based effort control system. This was corrected under Amendment 6 to the FMP (MAFMC, 1986) which restricted clammers to one trip per day. Unfortunately, prior to 1986, logbook records lack the specificity needed to discern whether landings on a particular day resulted from one or two trips. Therefore, all landings recorded for the same date have been totalled for the purpose of calculating best trip.

Since catch rates for most vessels have generally increased with the recovery of the Mid-Atlantic stock, this allocation formula exhibits greater deviations from long term catch than for short term catch. When compared to the long term baseline, the maximum deviation is an increase of 9,680% and the minimum is a loss of 47% (Appendix Table 2.1). Both the mean and median are positive, 253% and 16% respectively, indicating that this allocation formula redistributes a small portion of the shares from a few long term strong performers to a larger number of marginal participants. Although the relative increase to some vessels is extremely large, the actual amount in bushels is much less. (Appendix Table 2.2) This is because a few vessels have infrequently fished to capacity and are being awarded some of the share of large vessels with consistently large catches. Absolute changes in bushels are similar but less extreme than those for the cubic formula (Appendix Table 2.2).

When compared to the short term baseline, the maximum deviation is an increase of 788% and the minimum is a loss of 40% (Appendix Table 2.1). The median is -6%, indicating that this allocation formula redistributes

a small portion of the shares of many recent strong performers to a few participants whose best trip was greatly in excess of their norm. The difference from the long term baseline is that catch rates of most vessels have increased in recent years, reflecting the trip capacity of the vessel to a greater extent than before. The absolute changes in bushels are more similar to the cubic formula when compared to the 1985-87 base line (Appendix Table 2.2).

2.5. Based on Best of Historical Participation or Cubic

Permitted vessels which harvested Mid-Atlantic area surf clams (based on logbook reports) between 1 January 1979 and 31 December 1987 are eligible for an initial allocation.

The initial distribution will be based on the percentage of the total catch of Mid-Atlantic Area surf clams that the particular vessel caught (based on logbook reports) during the 1 January 1979 - 31 December 1987 period or on the percentage of the total volume (length × width × depth) of all permitted vessels that the particular vessel's volume represents, whichever is greater for each vessel.

Adjustments necessary to rationalize the fleet total allocation with the quota will be made.

For purposes of calculating historical participation, vessels that have replaced other vessels will be credited with the catch of the vessels they replaced.

Since this allocation formula is a blending of historical performance with a criterion independent of catch history, the deviations from both base lines, thought large, are more moderate than with cubic alone. When compared to the long term baseline, the maximum deviation is an increase of over 90,000% and the minimum is a loss of 6% (Appendix Table 2.1). The median is -6%, indicating that this allocation formula redistributes a small portion of the shares from many long term strong performers to a lesser number of participants whose vessels did not normally fish to capacity as measured by the cubic method. Although the relative increase to some vessels is extremely large, the actual amount in bushels is much less (Appendix Table 2.2). This is because a few large vessels have not fished to capacity and are being awarded some of the share of large vessels with consistently large catches.

When compared to the short term baseline, the maximum deviation is an increase of 1,120% and the minimum is a loss of 59% (Appendix Table 2.1). The median is -4%, indicating that this allocation formula redistributes to a lesser extent a small portion of the shares of many recent strong performers to a few long term participants. The reason for the difference from the long term baseline is again due to the formula's cubic component in that catch rates of most vessels have increased in recent years, reflecting the capacity of the vessel to a greater extent than before. Redistribution in terms of absolute bushels is more moderate than for the straight cubic formula (Appendix Table 2.2).

3. FORMULAS FOR TRIP LIMIT ALLOCATION OF SURF CLAMS IN THE MID-ATLANTIC AREA

3.1. Trip Limits Based on Average Trip Catch for the Period 1979 - 1987

Each vessel permitted for the Mid-Atlantic Area surf clam fishery will be given a trip allocation based on the vessel's average trip catch for 1979-1987 The vessel's catch would be summed and divided by the total number of trips taken during the period.

The fleet's total catch per trip is calculated by summing the individual vessel trip limits.

Vessels may be replaced without limit, but the trip limit will remain the same as that of the retiring vessel.

Two trip limits may be consolidated on one vessel, except that the receiving vessel may only get 60% of the trip limit of the retiring vessel. No vessel may have more than two trip limits. The 40% loss would be reallocated to the remaining vessels by NMFS.

When the average trip for each permitted vessel is calculated as above and summed for the fleet, 72,579 bushels would be landed per fleet trip. Dividing this into the annual Mid-Atlantic quota of 2,650,000 bushels gives a minimum number of 36 trips. If all vessels do not catch their limit on all trips, more trips would be allowed. This is unlikely, however, since only 25 trips were needed to take the quota in 1987. Obviously, setting the limit at the average trip would restrict fishing activities even more than under the present system.

When the individual trip limits are multiplied by the number of allowable trips, the indirect annual allocations are calculated. It is evident from the statistics in Appendix Table 2.1 that this trip limit formula

results in major redistributions from both short and long term history when comparing the relative change in bushels. The deviations are similar to the cubic allocation, though not quite as extreme, and result from shifting catch away from long term steady performers (Appendix Table 2.3).

3.2. Trip Limits Based on Vessel Cubic Dimensions

Each vessel permitted for the Mid-Atlantic Area surf clam fishery will be given a trip allocation based on the cubic dimensions of each vessel are determined by multiplying the regulation length x width x depth. This number (in cubic feet) is multiplied by 0.0016 to yield the vessel's trip limit in cages and multiplied by 32 to yield the vessel's trip limit in bushels.

The fleet's total catch per trip is calculated by summing the individual vessel trip limits.

Vessels may be replaced without limit, but the trip limit will remain the same as that of the retiring vessel.

Two trip limits may be consolidated on one vessel, except that the receiving vessel may only get 60% of the trip limit of the retiring vessel. No vessel may have more than two trip limits. The 40% loss would be reallocated to the remaining vessels by NMFS.

When the cubic trip for each permitted vessel is calculated as above and summed for the fleet, 130,136 bushels would be landed per fleet trip. Dividing this into the annual Mid-Atlantic quota of 2,650,000 bushels gives a minimum number of 20 trips. If all vessels do not catch their limit on all trips, more trips would be allowed. This is unlikely, however, since the six hour per trip time limit would be removed, enabling vessels to continue fishing until the trip limit is met. Obviously, setting the limit at the cubic trip would restrict fishing days even more than under the present system.

When the individual trip limits are multiplied by the number of allowable trips, the indirect annual allocations are calculated. It is evident from the redistribution statistics in Appendix Tables 2.5 and 2.6 that this trip limit formula is identical to the direct allocation based on cubic above.

3.3. Trip Limits Based on a Vessel's Best Trip

Each vessel permitted for the Mid-Atlantic Area surf clam fishery will be given a trip allocation based on the vessel's highest recorded trip catch (based on logbook records).

The fleet's total catch per trip is calculated by summing the individual vessel trip limits.

Vessels may be replaced without limit, but the trip limit will remain the same as that of the retiring vessel.

Two trip limits may be consolidated on one vessel, except that the receiving vessel may only get 60% of the trip limit of the retiring vessel. No vessel may have more than two trip limits. The 40% loss would be reallocated to the remaining vessels by NMFS.

When the best trip for each permitted vessel is calculated as above and summed for the fleet, 243,735 bushels would be landed per fleet trip. Dividing this into the annual Mid-Atlantic quota of 2,650,000 bushels gives a minimum number of 10 trips. If all vessels do not catch their limit on all trips, more trips would be allowed. This is more likely than with the other two formulas because the best trip is in some cases an artifact of the recordkeeping system because of multiple landings on the same date. Even though the six hour per trip time limit would be removed, enabling vessels to continue fishing until the trip limit is met, the best trip may represent an infeasible or unsafe loading for some vessels. Obviously, setting the limit at the best trip would restrict fishing days even more than under the present system and may exacerbate the vessel safety problem already inherent in the fishery.

When the individual trip limits are multiplied by the number of allowable trips, the indirect annual allocations are calculated. It is evident from the redistribution statistics in Appendix Tables 2.5 and 2.6 that this trip limit formula is identical to the direct allocation based on best trip above.

Table 2.1. Percent Change in Catch Share under Various Allocation Formulas Compared to Two Time Series Allocation Area/Comparison

Formula	Species	Base	% Change in Bushels Minimum	Median	Maximum	Mean
History	Mid-Atlantic surf clams only	79-87	18	19	20	19
		85-87	-60	-1	212	1
Weighted history	Mid-Atlantic surf clams only	79-87	-12	22	81	26
		85-87	-40	2	169	2
Cubic	Mid-Atlantic surf clams only	79-87	-58	18	119220	1552
		85-87	-52	-11	1442	36
Best Trip	Mid-Atlantic surf clams only	79-87	-47	16	9680	253
		85-87	-40	-6	788	27
Best of History or Cubic	Mid-Atlantic surf clams only	79-87	-6	-6	94400	1222
		85-87	-59	-4	1120	24
Trip Limit - Average	Mid-Atlantic surf clams only	79-87	-45	24	32760	645
		85-87	-49	2	309	17
Trip Limit - Cubic	Mid-Atlantic surf clams only	79-87	-58	18	119220	1552
		85-87	-52	-11	1442	36
Trip Limit - Best Trip	Mid-Atlantic surf clams only	79-87	-47	16	9680	253
		85-87	-40	-6	788	27

Table 2.2. Percent Change in Catch Share (bushels) under Various Allocation Formulas Compared to Two Time Series Allocation Area/Comparison

Formula	Species	Base	% Change in Bushels Minimum	Median	Maximum	Mean
History	All Surf Clams	79-87	29	31	40	31
		85-87	-57	1	244	3
Weighted history	All Surf Clams	79-87	-6	37	96	41
		85-87	-35	5	191	5
Adjusted History	All Surf Clams	79-87	-2	35	12820	180
		85-87	-37	5	200	14
Best of Adjusted History or Adjusted Cubic	All Surf Clams	79-87	-16	25	101140	970
		85-87	-46	-1	459	26
Cubic	All Surf Clams	79-87	-53	41	132420	1281
		85-87	-68	-2	854	42
History	Ocean quahogs	79-87	61	66	72	66
		85-87	-46	-16	1454	68
Weighted history	Ocean quahogs	79-87	22	87	147	84
		85-87	-18	4	1096	63
Cubic	Ocean quahogs	79-87	-68	392	244783	12009
		85-87	-70	69	40547	1694
Average of Years Fished	Ocean quahogs	79-87	19	168	1043	366
		85-87	-39	30	3240	144

Table 2.3. Absolute Change in Catch Share and Bushels for Surf Clams under Various Annual Allocation Formulas Compared to Two Time Series

Allocation formula	Comparison Base	Change from Base Minimum	Median	Maximum
History	79-87 Ratio	<-.000001	<.000001	<.000001
	85-87 Ratio	-.012649	-.000150	.008547
	79-87 Bushels	2	3962	18935
	85-87 Bushels	-35983	234	29473
Weighted History	79-87 Ratio	-.004047	.000164	.004410
	85-87 Ratio	-.008239	-.000026	.006206
	79-87 Bushels	-85	4505	20370
	85-87 Bushels	-22091	659	20688
Adjusted History	79-87 Ratio	-.005210	.000123	.012937
	85-87 Ratio	-.004765	.000026	.009782
	79-87 Bushels	-884	3968	42461
	85-87 Bushels	-12027	808	31776
Best of Adjusted History or Adjusted Cubic	79-87 Ratio	-.007873	-.000176	.010748
	85-87 Ratio	-.006540	-.000399	.007593
	79-87 Bushels	-7851	3028	35472
	85-87 Bushels	-17558	273	24880
Cubic	79-87 Ratio	-.015880	.000244	.021060
	85-87 Ratio	-.011877	-.000293	.017905
	79-87 Bushels	-31087	4297	67955
	85-87 Bushels	-34367	-84	57363

Table 2.4. Absolute Change in Catch Share and Bushels for Ocean Quahogs under Various Annual Allocation Formulas Compared to Two Time Series

Allocation formula	Comparison Base	Change from Base Minimum	Median	Maximum
History	79-87 Ratio	<-.000001	<.000001	<.000001
	85-87 Ratio	-.024820	-.000066	.039945
	79-87 Bushels	5	7546	139182
	85-87 Bushels	-82224	99	246778
Weighted History	79-87 Ratio	-.010180	.000039	.008625
	85-87 Ratio	-.016195	-.000032	.029765
	79-87 Bushels	2	11490	112708
	85-87 Bushels	-30476	224	185698
Cubic	79-87 Ratio	-.041762	.004254	.027148
	85-87 Ratio	-.038490	.003408	.026718
	79-87 Bushels	-125205	31383	163615
	85-87 Bushels	-156086	23811	161416
Average of Years Fished	79-87 Ratio	-.016559	.000337	.026068
	85-87 Ratio	-.014880	.000107	.027262
	79-87 Bushels	73	12890	184408
	85-87 Bushels	-45857	3964	170677

Table 2.5. Absolute Change in Catch Share and Bushels for Mid-Atlantic Surf Clams under Various Annual Allocation Formulas Compared to Two Time Series

Allocation formula	Comparison Base	Change from Base Minimum	Median	Maximum
History	79-87 Ratio	<-.000001	<.000001	<.000001
	85-87 Ratio	-.008999	-.000008	.007908
	79-87 Bushels	1	2426	10218
	85-87 Bushels	-23038	6	21666
Weighted History	79-87 Ratio	-.003745	.000112	.003088
	85-87 Ratio	-.005911	.000003	.005748
	79-87 Bushels	-887	2730	11034
	85-87 Bushels	-14854	199	15601
Best of History or Cubic	79-87 Ratio	-.005153	-.000888	.009852
	85-87 Ratio	-.008542	-.000190	.007247
	79-87 Bushels	-3436	-411	28210
	85-87 Bushels	-21906	-152	19380
Cubic	79-87 Ratio	-.014089	-.000004	.013800
	85-87 Ratio	-.008144	-.000472	.010075
	79-87 Bushels	-27118	2231	38672
	85-87 Bushels	-20628	-842	26873
Best trip	79-87 Ratio	-.010485	-.000108	.011040
	85-87 Ratio	-.005558	-.000411	.009844
	79-87 Bushels	-19106	1613	30042
	85-87 Bushels	-13903	-781	26518

Table 2.6. Absolute Change in Catch Share and Bushels for Mid-Atlantic Surf Clams Various Trip Limit Allocation Formulas Compared to Two Time Series

Allocation formula	Comparison Base	Change from Base Minimum	Median	Maximum
Average Trip	79-87 Ratio	-.011605	.000175	.013646
	85-87 Ratio	-.007096	.000121	.008292
	79-87 Bushels	-21714	2709	38263
	85-87 Bushels	-18075	623	22385
Cubic	79-87 Ratio	-.014089	-.000004	.013800
	85-87 Ratio	-.008144	-.000472	.010075
	79-87 Bushels	-27118	2231	38672
	85-87 Bushels	-20628	-842	26873
Best Trip	79-87 Ratio	-.010485	-.000108	.011040
	85-87 Ratio	-.005558	-.000411	.009844
	79-87 Bushels	-19106	1613	30042
	85-87 Bushels	-13903	-781	26518

APPENDIX 3. ENVIRONMENTAL ASSESSMENT ON AMENDMENT #8 TO THE SURF CLAM AND OCEAN QUAHOG FISHERY MANAGEMENT PLAN (FMP)

1. INTRODUCTION

The Council has been involved in surf clam and ocean quahog management since its first meeting (September 1976), when it was discussed that the surf clam fishery should be the first for which a plan should be developed. At the February 1977 meeting the Council voted to accept responsibility for the surf clam plan and began discussion of possible management measures. From April through August 1977 every meeting included a debate over possible management measures. Public hearings were conducted during June 1977, with major revisions proposed to the management system based on public comments. The original FMP (MAFMC, 1977) was approved in November 1977 for the period through September 1979. Amendment #1 extended it through 31 December 1979. It contained specific quarterly quotas for surf clams (350,000 bu each for October - December and January - March and 550,000 bu each for April - June and July - September) and an annual quota (3,000,000 bu) for ocean quahogs. The effort limitation, permit, and logbook provisions were included. The FMP (MAFMC, 1977) also instituted a moratorium in the surf clam fishery (all surf clams, since there was no New England Area) for one year to allow time for the development of an alternative limited entry system"such as a stock certificate program".

Amendment #1 (MAFMC, 1979) extended the FMP for ninety days, until the end of 1979 (primarily to allow for completion of the latest stock assessment). It added processor reporting requirements and removed the requirement that each quarter begin with four days of fishing (even though the stock was depressed, the excess harvesting capacity led to closures very quickly. The moratorium was continued.

Amendment #2 (MAFMC, 1980) extended the FMP through the end of 1981, divided the surf clam portion of the management unit into the New England and Mid-Atlantic Areas. Annual quotas were 25,000 bu of surf clams for the New England Area, 1,800,000 bu of surf clams for the Mid-Atlantic Area, 3,500,000 bu of quahogs for 1980, and 4,000,000 bu of quahogs for 1981. The quarterly quotas in the Mid-Atlantic Area were moving closer to equal (400,000 bu for the fall and winter quarters and 500,000 bu for the spring and summer quarters. The bad weather make up day was introduced. The moratorium was continued in the Mid-Atlantic Area.

Amendment #3 (MAFMC, 1981), approved 13 November 1981, extended the FMP indefinitely. A 5.5" surf clam minimum size limit was imposed in the Mid-Atlantic Area. The surf clam fishing week in the Mid-Atlantic Area was expanded to Sunday - Thursday from Monday - Thursday. Quota setting was put on a framework basis with ranges of 1.8 - 2.9 million bu for Mid-Atlantic Area surf clams, 25,000 - 100,000 bu for New England Area surf clams, and 4 - 6 million bu for ocean quahogs. The Council proposed a permit limitation system to replace the moratorium which was disapproved by NMFS; NMFS extended the moratorium.

Amendment #4 was initiated in response to a closure of the New England Area to surf clam fishing during the second half of 1983. On 21 July 1983 the New England Council sent a letter to the Secretary of Commerce requesting Secretarial action to reopen the New England Area surf clam fishery. The Mid-Atlantic Council passed a motion in August 1983 recommending that the Secretary not accept the proposal of the New England Council. After receiving a letter from the Secretary on 6 September 1983 denying implementation of emergency action to reopen the surf clam fishery in the New England Area, work was begun to investigate methods for avoiding an extended closure in 1984. In November 1983 the Mid-Atlantic Council passed a motion authorizing the Regional Director and the New England Council to prepare an Amendment for the New England Area involving trip limits, quarterly quotas, or similar strategies to insure fishing throughout the year. A proposed Amendment #4 was drafted by the New England Council staff in cooperation with NMFS staff and hearings were held on 21 and 22 March 1984. At a joint meeting of the New England and Mid-Atlantic Councils in May 1984 representatives of the surf clam industry from both New England and the Mid-Atlantic presented revisions to the proposed regime. The Mid-Atlantic Council passed a motion to adopt the proposed Amendment #4 to the Surf Clam and Ocean Quahog FMP as amended to provide that any unharvested portion of a bimonthly allocation be added to the immediately following bimonthly allocation rather than being prorated over all remaining bimonthly periods and that trip and weekly limits be by vessel classes based on relative fishing power using the following ratios: Class 1 = 1.0, Class 2 = 1.8, and Class 3 = 3.4, and that NMFS use a rulemaking procedure to implement the Amendment on an emergency basis. The New England Council voted at the same meeting to adopt the Amendment.

The provisions of Amendment #4 were implemented on an emergency basis for 180 days beginning 1 July 1984, during which time the Amendment was finalized by the New England Council and submitted for Secretarial approval. However, it was determined that the document was not structurally complete for review.

Amendment #5 (MAFMC, 1985), approved 28 February 1985, allowed for revision of the surf clam minimum size limit provisions, extended the size limit throughout the entire fishery, and instituted a requirement that cages be tagged.

Amendment #6 (MAFMC, 1986) was begun in October 1984 following an exploratory fishery conducted on Georges Bank as a result of emergency regulations published 2 August 1984 (49 *FR* 30946-30948), primarily to address problems associated with the development of a surf clam fishery on Georges Bank. At its October 1984 meeting the Council voted to divide the New England Area into the Nantucket Shoals and Georges Bank Areas, the dividing line being 69° longitude. At the same meeting the Council voted to approve revising proposed Amendment #4 so its provisions applied to that portion of the New England Area west of 69° longitude.

In response to the Council's recommendation that Amendment #4 be revised to apply only to that portion of the New England Area west of 69°, the New England Council held a hearing on 11 December 1984.

At its December 1984 meeting the Council adopted the provisions of Amendment #6. The Amendment was adopted by the Council for hearings in January 1985, with hearings held 18 and 19 February 1985. The Council adopted Amendment #6 for Secretarial approval at its March 1985 meeting. At that time Amendment #4 still had not been found structurally complete. Given the relationship between the provisions of Amendments #4 and #6, the decision was made to abandon Amendment #4 and the Mid-Atlantic Council would combine the provisions of Amendment #4 with the Mid-Atlantic Council's Amendment #6 in one document. The combination of Amendments #4 and #6 did not change any substantive provisions of either Amendment.

The Council was notified via a letter of 25 July 1985 that NMFS had partially approved Amendment #6. The letter from Acting Regional Director Richard H. Schaefer to Council Chairman Robert L. Martin stated in part:

> "The measures in Amendment 6 that I disapproved are the Nantucket Shoals Area bimonthly quota guidelines and effort control measures, the one landing per day restriction applying to the Mid-Atlantic Area, the provision prohibiting the Regional Director from subdividing allowable fishing hours when the hours are set at 12 or less, and the portion of the notification provision prohibiting vessels that have fished in a notification zone from returning to fish in the same notification zone within that calendar month. The disapproval of the bimonthly guidelines for Nantucket Shoals removed the basis for adjusting the quotas between bimonthly periods when harvest either exceeds or falls short of quota. Therefore, this provision, while not specifically disapproved, can not be implemented on Nantucket Shoals at this time." (This measure was one developed jointly by the New England Council and the NMFS Northeast Regional Office.)

The Council revised Amendment #6 to replace the bimonthly quotas with quarterly quotas, eliminate the weekly landing limits for the Nantucket Shoals Area, clarify the quota adjustment provisions for the Nantucket Shoals and Georges Bank Areas, and present additional justification for the one landing per trip provision. The other disapproved provisions (prohibition on subdividing allowed fishing times under certain conditions and portions of the notification system) were deleted from the Amendment. The Amendment was approved on 9 April 1986 when the 60 day review period expired without action by NMFS.

Amendment #7 (MAFMC, 1987) was developed to change the quota distribution on Georges Bank (from 20:40:40:20 to equal quarterly quotas) and revise the roll over provisions from one period to the next. This amendment was taken to public hearings in February 1987, approved by NMFS, and final regulations published on 24 July 1987.

2. PURPOSE OF AND NEED FOR ACTION

This Amendment to the Fishery Management Plan for the Atlantic Surf Clam and Ocean Quahog Fisheries (FMP), prepared by the Mid-Atlantic Fishery Management Council (Council), is intended to: (1) institute a vessel allocation system in the surf clam and ocean quahog fisheries; (2) remove effort limitations for all Areas; (3) combine the Mid-Atlantic, Nantucket Shoals, and Georges Bank Areas; and (4) revise the surf clam minimum size limit provision. The management unit is all surf clams (*Spisula solidissima*) and all ocean quahogs (*Arctica islandica*) in the Atlantic exclusive economic zone (EEZ). The objectives of the FMP are:

1. Conserve and rebuild Atlantic surf clam and ocean quahog resources by stabilizing annual harvest rates throughout the management unit in a way that minimizes short term economic dislocations.
2. Simplify to the maximum extent the regulatory requirement of clam and quahog management to minimize the government and private cost of administering and complying with regulatory, reporting, enforcement, and research requirements of clam and quahog management.
3. Provide the opportunity for industry to operate efficiently, consistent with the conservation of clam and quahog resources, which will bring harvesting capacity in balance with processing and biological capacity and allow industry participants to achieve economic efficiency including efficient utilization of capital resources by the industry.
4. A management regime and regulatory framework which is flexible and adaptive to unanticipated short term events or circumstances and consistent with overall plan objectives and long term industry planning and investment needs.

The adopted management measures for purposes of public hearings are presented in FMP sections 2 and 9.1 They are evaluated in FMP section 9.2.

3. ALTERNATIVES

The alternative management measures are presented and evaluated in Appendix 1 to the FMP. Alternative allocation formulas are presented and evaluated in Appendix 2 to the FMP.

4. ENVIRONMENTAL IMPACTS

The environmental impacts of the management regime instituted in the original FMP were described in the Environmental Impact Statement accompanying the FMP, and in the Supplemental Environmental Impact Statements or Environmental Assessments accompanying the Amendments. The adopted management measures are evaluated in FMP section 9.2. The alternative management measures are evaluated in Appendix 1 to the FMP. Alternative allocation formulas are presented and evaluated in Appendix 2 to the FMP.

5. EFFECT ON ENDANGERED SPECIES AND ON THE COASTAL ZONE

Neither the Amendment or the alternatives would constitute an action that "may affect" endangered or threatened species or their habitat within the meaning of the regulations implementing Section 7 of the Endangered Species Act of 1973. Thus, consultation procedures under Section 7 will not be necessary on the Amendment.

Also, the Amendment will be conducted in a manner consistent, to the maximum extent practicable, with the Coastal Zone management Programs within the meaning of Section 307(c)(1) of the Coastal Zone Management Act of 1972 and its implementing regulations. A determination that this action is consistent with the approved State coastal zone management programs has been prepared by the Council and submitted for review to each of the State coastal zone management agencies.

6. EFFECTS ON FLOOD PLAINS OR WETLANDS

The Amendment or its alternatives will not adversely affect flood plains or wetlands, and trails and rivers listed or eligible for listing on the National Trails and Nationwide Inventory of Rivers.

7. List of Agencies and Persons Consulted in Formulating the Proposed Action

In preparing Amendment #8, the Council consulted with NMFS, the Fish and Wildlife Service, the Department of State, and the States of New York, New Jersey, Pennsylvania, Delaware, Maryland, and Virginia through their membership on the Council. In addition to the States that are members of the Council, Maine, New Hampshire, Massachusetts, Rhode Island, and Connecticut will be consulted through the Coastal Zone Management Program consistency process. A list of the agencies and persons sent copies of the Amendment, including the EA and RIR, and notice of the public hearings in in the Council's files.

8. List of Preparers of Environmental Assessment and Plan Amendment

Amendment #8 was prepared by a team of fishery managers and scientists with special expertise in the surf clam and ocean quahog resources including: the Mid-Atlantic Council Surf Clam and Ocean Quahog Committee (Dr. Lee Anderson, Robert Martin, John Burger, Thomas McVey, and William Wells); the NEFMC Surf Clam Oversight Committee (Robert Smith, Phillip Coates, and William Lund); and MAFMC staff John C. Bryson, David R. Keifer, Thomas Hoff, Clayton Heaton, Christopher Rogers, and Christopher Moore.

9. Findings of No Significant Environmental Impact

For the reasons discussed above, it is hereby determined that neither approval and implementation of the proposed action nor the alternative would affect significantly the quality of the human environment, and that the preparation of an environmental impact statement on the Amendment is not required by Section 102(2)(c) of the National Environmental Policy Act nor its implementing regulations.

_____ _____

Assistant Administrator for Fisheries, NOAA Date

APPENDIX 4. REGULATORY IMPACT REVIEW

1. INTRODUCTION

1.1. Purpose

The Council has been involved in surf clam and ocean quahog management since its first meeting (September 1976), when it was discussed that the surf clam fishery should be the first for which a plan should be developed. At the February 1977 meeting the Council voted to accept responsibility for the surf clam plan and began discussion of possible management measures. From April through August 1977 every meeting included a debate over possible management measures. Public hearings were conducted during June 1977, with major revisions proposed to the management system based on public comments. The original FMP (MAFMC, 1977) was approved in November 1977 for the period through September 1979. Amendment #1 extended it through 31 December 1979. It contained specific quarterly quotas for surf clams (350,000 bu each for October - December and January - March and 550,000 bu each for April - June and July - September) and an annual quota (3,000,000 bu) for ocean quahogs. The effort limitation, permit, and logbook provisions were included. The FMP (MAFMC, 1977) also instituted a moratorium in the surf clam fishery (all surf clams, since there was no New England Area) for one year to allow time for the development of an alternative limited entry system"such as a stock certificate program".

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Amendment #4 was initiated in response to a closure of the New England Area to surf clam fishing during the second half of 1983. On 21 July 1983 the New England Council sent a letter to the Secretary of Commerce requesting Secretarial action to reopen the New England Area surf clam fishery. The Mid-Atlantic Council passed a motion in August 1983 recommending that the Secretary not accept the proposal of the New England Council. After receiving a letter from the Secretary on 6 September 1983 denying implementation of emergency action to reopen the surf clam fishery in the New England Area, work was begun to investigate methods for avoiding an extended closure in 1984. In November 1983 the Mid-Atlantic Council passed a motion authorizing the Regional Director and the New England Council to prepare an Amendment for the New England Area involving trip limits, quarterly quotas, or similar strategies to insure fishing throughout the year. A proposed Amendment #4 was drafted by the New England Council staff in cooperation with NMFS staff and hearings were held on 21 and 22 March 1984. At a joint meeting of the New England and Mid-Atlantic Councils in May 1984 representatives of the surf clam industry from both New England and the Mid-Atlantic presented revisions to the proposed regime. The Mid-Atlantic Council passed a motion to adopt the proposed Amendment #4 to the Surf Clam and Ocean Quahog FMP as amended to provide that any unharvested portion of a bimonthly allocation be added to the immediately following bimonthly allocation rather than being prorated over all remaining bimonthly periods and that trip and weekly limits be by vessel classes based on relative fishing power using the following ratios: Class 1 = 1.0, Class 2 = 1.8, and Class 3 = 3.4, and that NMFS use a rulemaking procedure to implement the Amendment on an emergency basis. The New England Council voted at the same meeting to adopt the Amendment.

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Amendment #7 (MAFMC, 1987) was developed to change the quota distribution on Georges Bank (from 20:40:40:20 to equal quarterly quotas) and revise the roll over provisions from one period to the next. This amendment was taken to public hearings in February 1987, approved by NMFS, and final regulations published on 24 July 1987.

This Amendment to the Fishery Management Plan for the Atlantic Surf Clam and Ocean Quahog Fisheries (FMP), prepared by the Mid-Atlantic Fishery Management Council (Council), is intended to: (1) institute a vessel allocation system in the surf clam and ocean quahog fisheries; (2) remove effort limitations for all Areas; (3) combine the Mid-Atlantic, Nantucket Shoals, and Georges Bank Areas; and (4) revise the surf clam minimum size limit provision. The management unit is all surf clams (*Spisula solidissima*) and all ocean quahogs (*Arctica islandica*) in the Atlantic exclusive economic zone (EEZ).

The adopted management measures are presented in FMP sections 2 and 9.1 They are evaluated in FMP section 9.2.

1.2. Description of User Groups

The fishery is described in Sections 7 and 8 of the Amendment.

1.3. Problems Addressed by the Amendment

The problems to be addressed are discussed in Section 4.2 of the Amendment.

1.4. Management Objectives

The objectives of the FMP are:

1. Conserve and rebuild Atlantic surf clam and ocean quahog resources by stabilizing annual harvest rates throughout the management unit in a way that minimizes short term economic dislocations.
2. Simplify to the maximum extent the regulatory requirement of clam and quahog management to minimize the government and private cost of administering and complying with regulatory, reporting, enforcement, and research requirements of clam and quahog management.
3. Provide the opportunity for industry to operate efficiently, consistent with the conservation of clam and quahog resources, which will bring harvesting capacity in balance with processing and biological capacity and allow industry participants to achieve economic efficiency including efficient utilization of capital resources by the industry.
4. A management regime and regulatory framework which is flexible and adaptive to unanticipated short term events or circumstances and consistent with overall plan objectives and long term industry planning and investment needs.

1.5. Provisions of the Amendment

The adopted management measures are presented in FMP sections 2 and 9.1 They are evaluated in FMP section 9.2.

2. REGULATORY IMPACT ANALYSIS

The costs and benefits of the proposed action are set forth in Section 9.2 of the Amendment. The costs and benefits of the alternatives to the proposed action are set forth in Appendix 1 the Amendment. The costs and benefits of the alternative allocation formulas associated with the alternatives to the proposed action are set forth in Appendix 2 the Amendment.

3. DISCUSSION OF THE BENEFITS AND COSTS OF THE AMENDMENT

E.O. 12291 requires that a benefit-cost analysis of all proposed regulations be performed. The costs and benefits of the proposed action are set forth in Section 9.2 of the Amendment. The costs and benefits of the alternatives to the proposed action are set forth in Appendix 1 the Amendment. The costs and benefits of the alternative allocation formulas associated with the alternatives to the proposed action are set forth in Appendix 2 the Amendment.

4. OTHER E.O. 12291 REQUIREMENTS

E.O. 12291 requires that the following three issues be considered:

1. Will the Plan have an annual effect on the economy of $100 million or more.
2. Will the Plan lead to an increase in the costs or prices for consumers, individual industries, Federal, State, or local government agencies or geographic regions.
3. Will the Plan have significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of US based enterprises to compete with foreign based enterprises in domestic or export markets.

The Amendment should not have an annual effect of $100 million or more since the total fishery (both inshore and EEZ) had a value of only $45 million in 1987 down from a high of $59 million in 1986.

The Amendment should not lead to an increase in the costs or prices for consumers, individual industries, Federal, State, or local government agencies or geographic regions. It is expected that the governmental costs of implementing the Amendment will be similar to those experienced in enforcing the current FMP. NMFS enforcement costs should decrease because of the revisions to the enforcement provisions of the regulations.

The Amendment should not have significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of US based enterprises to compete with foreign based enterprises in domestic or export markets. It should have no impact on competition, employment, investment, innovation, or foreign competition.

5. IMPACTS OF THE PLAN RELATIVE TO THE REGULATORY FLEXIBILITY ACT AND THE PAPERWORK REDUCTION ACT OF 1980

The Regulatory Flexibility Act requires the examination of the impacts on small businesses, small organizations, and small jurisdictions. This is done in Sections 9.2 and 9.3.3.5.

The Paperwork Reduction Act concerns the collection of information. The intent of the Act is to minimize the Federal paperwork burden for individuals, small business, State and local governments, and other persons as well as to maximize the usefulness of information collected by the Federal government. This is done in Sections 9.2 and 9.3.3.5.

APPENDIX 5. PUBLIC HEARING SUMMARIES

22 February, Pocomoke City, MA

The hearing began at 7:00 pm. MAFMC member, Lee Anderson was the moderator. Others present included Albert Goetze (MAFMC), John Bryson, Dave Keifer, and Chris Rogers (MAFMC staff), Jack Terrill (NMFS), and 36 members of the public.

Dr. Anderson reviewed the procedures for the hearing and Mr. Keifer reviewed the proposed Amendment 8 to the Surf Clam and Ocean Quahog Fishery Management Plan (Attachment 1).

Lee Anderson: Now we will open the hearing for your comments. In making your statements, please speak loud and clear so that we may record your comments for the record. Thank you. If you will come up to the first row here so that these small mikes can pick up your comments, it would be appreciated. Please remember that we are interested in learning why you favor or oppose a particular measure. The plan must meet the standards in the Magnuson Act, which means we must explain the reasons for and impact of each measure. Also please state your name for the record and the name of any organization for which you may be acting as an official spokesman. We have a sign up sheet. We will proceed with the comments in the order with which people signed up. The first speaker is Joe Garvilla.

Joe Garvilla representing United Shellfishermen's Association:

My name is Joe Garvilla. I represent United Shellfish Association. United Shellfish Association has voted against Amendment 8 in its entirety. The purpose of these remarks is to summarize why the USA opposed the Amendment. United Shellfish Association has a membership representing more than 60 vessels, many fishermen and several processing companies. In our last meeting the majority of membership, over 70 percent, voted to oppose Amendment 8 in its entirety.

To summarize our position, USA opposes the adoption of all or any portion of Amendment 8 on the grounds that it is unfair to fishermen, includes unnecessary and unneeded regulations. USA believes that the current flexible fishing schedule is superior to regulations proposed in Amendment 8. We believe that any modification of the current system should come about after an industry panel has had an opportunity to consider further issues and to recommend more limited changes to the system.

Some objectionable portions of Amendment 8 are: (1) The unlimited transfer of ocean quahog allocations immediately and the unlimited transfer of surf clam allocations in three years. USA always has been on record in opposition to this massive unlimited consolidation because it would provide unfair advantage to fleet owners; (2) The proposed allocation concept of Amendment 8 gives a resource to vessels without regard to fishermen. This system is unfair because it penalizes fishermen who may have worked for many years, but who have recently purchased a new vessel with little history. It unfairly penalizes fishermen who have had no market for their product for an undetermined period of time, unlike vertically integrated fleets who always have market. It penalizes fishermen who have spent vast sums of money to expand and upgrade their vessels with little or no history that are relying on the very system that is now in force to make their profit.

Amendment 8 makes no effort to abide by the National Standards which requires Council to prevent any fisherman from acquiring an excessive share of the quota in an allocation system. The Council attorney has suggested that anti-trust laws will control this, but we are advised that market shares well in excess of 50 percent is acceptable under antitrust laws. If one fisherman or a small group obtains a majority of the resource through a transfer of allocations regardless of allocation formula, the remaining independents will be unable to compete and be driven out of the market.

Regardless of allocation formula used, Amendment 8 would give the opportunity to foreign nations to control the resource. Two foreign nations are now active participants in the industry and both of those corporations have great financial power. Although the regulation may propose to prevent a foreign nation from owning an allocation permit it is not hard to imagine many methods by which working in concert through contracts with fishermen those foreign nations soon would control most of the domestic resource through the transfer and massive consolidation of surf clam and quahog quotas. These objections are applicable to all allocation formulas for quahogs and surf clams.

There are two additional points regarding quahogs that Amendment 8 makes it unacceptable to USA. Number 1, there is no rationale for a quahog allocation before a moratorium. Number 2, the ban on shucking at sea is short-sighted and unfair to those participants who have already invested millions of dollars in developing this alternative and who received no warning of this proposed ban. The only rationale offered for the

proposed ban is that it would prevent a complex enforcement problem from surfacing. USA believes that these concerns are unfounded since a shell stock to shucked meat ratio has already been established and is generally accepted by industry and National Marine Fisheries alike. The industry has twice voiced its objections to the concepts included in Amendment 8 at Norfolk last spring and at Philadelphia this summer. At the meeting in Philadelphia even the chairman of the Surf Clam Committee had a letter read into the record objecting to the Committee's disregard for industry views. The Council nevertheless voted to send this Amendment to public hearing. We hope that this time the Council will listen to our concerns and recognize it serves no one's interest to adopt a system so objectionable to industry. Thank you.

Lee Anderson: Yes, if you read a statement and have an extra copy, it would be helpful to leave it with us, just to help the secretaries transcribe. Obviously, not required. Next speaker will be Jim Pearson.

Jim Pearson representing Alexander & Pearson, Gortons Seafood:

My name is Jim Pearson, of Alexander and Pearson. We have two new stern riggers that are three years old and we have one under construction right now. And we are totally against this allocation system. The reason is that any formula they want to give us cuts us down two thirds of what we have been catching. And just on the two boats we have working right now if they put us on the best system they have our gross will drop a million one next year. And the new boat we are building we are building for quahogs because they already got the surf clams screwed up. And we won't make it with that thing, the way they want to do it.

We would just like to leave it like it is and I don't know why they want to change it anyway. I mean they are talking about rebuilding the stocks and there are more surf clams than there have ever been. And there's been the quahogs. We're working out in 35 fathom. We are catching 2,000 bushel now in four and a half hours. So I don't know how much stock you want to have. You know five fathom is loaded with clams we can't catch now, there's so many of them. And we just want to leave it like it is, we don't want any change. I am speaking for Gorton's Seafood and Alexander and Pearson, thanks.

Lee Anderson: Thank you. Next speaker will be Bill Gifford.

Bill Gifford representing Gifford Marine:

My name is Bill Gifford and I own 26 boats, 23 licensed sea clam boats and three large, licensed quahog boats. I want to go on record that I am opposing Amendment number 8 for three reasons. The first reason is the inclusion of quahogs in this Amendment. There is no reason in God's green earth to include quahogs in Amendment number 8.

You first should implement a moratorium on quahogs. And that should be done right now. If you have a boat under construction now, fine. If you don't, you're out of it. And then you should put some sort of a limit on the number of bushels that you have to catch per year in order to retain your quahog license. And I submit that if you are not catching 10,000 bushels a year of quahogs, you are not in the quahog fishery.

The second reason I oppose Amendment number 8 is the inclusion of no shucking at sea for either ocean quahogs or surf clams. I shucked surf clams in 1978 and we did very well at that. We haven't been able to shuck surf clams again because of the way the time based system is. But if we come to a system that is based on an allocation down the road, I'd certainly like to be one that could go shuck surf clams. And I'd also like to be able to shuck quahogs now and I intend to do it now. And I don't see any reason in the world why we need this in. I talked to a fisheries agent and it seems like there is some of a feeling that the only reason that it has to be is for enforcement. If that's the case, like Joe points out, everything is based on numbers. It is certainly simple enough to transfer a bushel number to a pound number. So I just can't see any reason in the world for a no shucking at sea policy.

The third thing that I would like to see is, if there is an allocation, that we are allowed to transfer that allocation freely, immediately. Not work into it down the road. There's going to be a lot of guys hurt no matter how it comes out. And there's going to be a lot of people that want to sell and transfer, do this and that and the other thing. So whatever type of system that's put into effect, it should be flexible.

And the last thing that I would like to say is, if something is going to be done, do it now. Don't put us through another ten years of hell that we have been through here in the surf clam fishery. Thank you.

Lee Anderson: Thank you. Wally Gordon.

Wally Gordon representing Mid-Atlantic Foods:

My name is Wally Gordon. I represent Mid-Atlantic Foods. We're a canner-processor of quahogs and surf clams. I guess this whole thing started through the desire to reduce over capitalization and safety and I guess unlike motherhood it's something that it's not too hard to be against. But I am concerned about Amendment 8 and I am here to oppose it in its entirety for several reasons.

I guess my main concern is that we're a small independent company and we're here to support the small independent fishermen because we see the need for the independent fisherman in the future to support our growth. I see this as an opportunity for dollars to control the industry on a long-term basis, rather than somebody that has a better mousetrap coming in and being able to build a business. People will be frozen out of this industry.

I think the clams are a national resource, not an individual right. Where you have a permit holder now that has a right to fish clams, that person must own a vessel, he's got to employ people, he's got to maintain that vessel and he has the responsibility to operate it safely and run a business. But it appears to me that we are setting up a situation here where somebody in Seattle can own permits and then come back in and run them out or divvy them out as he sees fit. And I am really opposed to that. I think this will severely reduce the people that are in control of the surf clam business. It's going to hurt the independent fisherman. If you have unlimited consolidation all at one time the guy that has only one permit can't economically afford to fish. I think it's against the American spirit, really, the way it would be impossible to get started without coming in and buying your way into the business.

I am also against the no-shuck-at-sea. And I think that in addition to the reasons that other people ventured here today, I think that everybody that's in the clam business is well aware of the environmental concerns that are going on. And while there may be a lot of money in land based shucking plants, one of these days that may be the solution to the problem is to shuck at sea. And I just don't see any reason for (banning it). As Bill Gifford said, there are ways to do this based on numbers and to automatically rule it out doesn't seem right to me. And the last point I would like to make is that while the Council may not feel that this is going to economically (lead to a monopoly as argued in)point 4(c), I really disagree with that. I think it's going to put the clam business in the hands of a few people. Thank you for hearing me.

Lee Anderson: Thank you. Next speaker is Ralph Elliott.

Ralph Elliott: I don't want to speak.

Lee Anderson: O.K. Jonathan Kahan

Jonathan Kahan representing Independent Shellfishing Association (Attachment 2):

My name is Jonathan Kahan, I am with the law firm of Hogan and Hartson from Washington, D.C. We are presently presenting the views of the Independent Shellfishing Association. That's a group, an ad hoc group, that was put together simply to respond to this Amendment and what's been going on recently concerning this fishery. We presently represent, I will just give you the list of names here: Max Cohen, R. D. Dempsey, Don DeMusz, Bill Gifford, Harry Higbee, Thomas Keenan, Frank Marriner, Charles McCullough, James Pearson, Dick Shaw, Barney Truex, Martin Truex, Wilbur Wiseman, Bordens, Gortons, and Sea Watch. In other words, the comments that we are submitting to you are on behalf of a good portion of industry and we agree with almost every one of the comments that have been stated today. We have filed some written comments to you. I will just briefly go over some of the comments that we put to you in writing If I went over them in length I would have everybody here in the room asleep. Lawyers put people to sleep a lot, and I would just as soon not do that tonight. But would urge you to read the written comments and make them part of the record.

We feel that there are lot of problems with Amendment number 8. The first problem we have with Amendment number 8, is that it isn't Amendment number 8. It's Amendment 8 a, b, c, d and e for surf clams and it's Amendment 8 a, b, c, and d for quahogs. We feel it's procedurally inappropriate and irregular for the Council to put so many options before industry. If the Council can't decided what they want, how the heck do they expect industry to comment logically on so many different alternatives? We feel that that is legally suspect and it tells you a lot about why you can't make a decision and why industry is having a tough time with this because it may well be as I'll indicate later that there is no one answer to this and that's the reason that this has been going on for the last 12 years without an answer. And sometimes when it ain't broke maybe you shouldn't fix it.

I am going to start out with quahogs. We feel that the bottom line to a lot of this is that there is going to be economic devastation to a good portion to this industry. And quahogs is a perfect example. We have an unregulated industry with a quota that has not been met. Why in the world would a government agency want to regulate an area that is unregulated, costing nothing right now for regulation and enforcement, when there is no indication whatsoever of a conservation problem? The quota has in fact been raised in recent years, rather than being lowered. There is no present shortage of quahogs and there is no basis under the National Standards which I am going to talk about in a minute for imposing any kind of allocation scheme on quahogs.

Let me start out by just going over the National Standards because if there is going to be any challenge to this thing it is going to be under the statutory provisions which you put up on the board there. And the first one I'm going to talk about is just for quahogs and then I am going to go into surf clams is "to promote efficiency in utilization of the resource." Contrary to what you've said, we feel that imposing some kind of allocation scheme on quahogs is going to increase inefficiency in the resource. Now a fisherman by being more efficient and improving his techniques can increase his catch. With allocation you limit the fishermen to a specific number of bushels. There's no incentive to improve technique, no incentive to modernize the vessels, and no incentive to work efficiently. In my view, that fails that national standard. Second, you are going to impose an allocation scheme for quahogs that's not going to minimize administrative costs or fishing costs. In fact, it's going to go completely the other way. You are going to end up doing is having a system where there are absolutely no administrative costs, well there are some, but literally not administrative costs for quahogs right now and you're going to impose a whole system of regulation on the quahog industry that in fact is going to cost both government and the fishermen a lot of money. You're going to have to check cages. You're going to have to calculate yearly allocations, you're going to have to keep track of transfers.

If that promotes efficiency in an unregulated industry, somebody let me know. Why would you increase such costs? I could see it if you had some kind of conservation measure at base. But in fact at base there is no conservation rationale for this and I just think it fails that national standard as well.

Probably most important, one of the national standards that you put up on the board is that this kind of system, this kind of FMP can't be adopted without some kind of valid scientific support. In fact there is no scientific support for quahogs. The annual quota in 1988 was sixty million pounds, if you annualize mid-year landings, you're up to about 44 million pounds. In the draft hearing statement at page 20 you say the total resources will remain stable for the next several years. At page 28 you say the resource surveys have not revealed detectable declines in the total quahog abundance. It seems to me that what you're saying is that there is not scientific data to back up any kind of allocation system for the quahog industry. And based upon that it seems to me you fail this national standard as well.

And I think as a couple of people already said, the history of this industry has been if you've got a problem with the resource, a conservation problem, you first go to some kind of quota. Instead you've been raising the quota here. Or you go to some kind or moratorium. You haven't done either one of those two things either. It seems to me it's arbitrary and capricious to use a nuclear weapon to kill a fly which basically is what you are doing here for the quahog industry.

The next national standard is if it becomes necessary to allocate, "such allocation has to be fair and equitable." Well we think that any kind of per-vessel allocation formula recommended by the Council staff, any of those in the draft hearing statement, is unfair and inequitable. For quahogs the allocations are based on an average yearly catch over the past ten years. Rather than, I think as one gentleman indicated, rather than rewarding fishermen, you're attaching this thing to vessels. So a fisherman who has a new vessel is completely blown out of the water. Or one who has taken his ship out for repairs for a period of time and is not fishing is blown out of the water. How is that fair and equitable? In fact you could put a number of these people with new boats, Jim Pearson is a perfect example, right out of business. Millions of dollars invested in new boats. Boom! He's out of business because you guys think that this is good social engineering, when in fact there is absolutely no conservation rationale whatsoever for it. Is that fair? Is that equitable? I think that one fails that national standard as well.

The next National Standard, part of the same standard, is "Any allocation should not give a particular fisherman or corporation an excessive share. I think what you have heard is unanimity here that what you're going to end up doing is ending up with a consolidation of this industry. The hearing statement at page 67 says that under this new system you are proposing fishermen are no longer forced to compete with one another. That's almost a literal quote from your hearing statement. Now, if I remember correctly, Congress passed antitrust laws based on the fact that they didn't want anti-competitive schemes put into place under U.S. law. If

you're going to do it, you had better have a good rationale for it and we don't see any rationale for this kind of anti-competitive scheme you're setting up. Under this scheme, you can have, no question about it, a foreign company or foreign companies coming in and taking over under an allocation system the entire quahog industry. And now, right now I am talking about quahogs, but it applies equally to surf clams. And we have cited in our comments to you on page 19 various cases showing that anywhere from 50 to 100 percent of a certain relevant market has been held by the courts not to violate the antitrust laws. We cited you a case in our comments which says that 100 percent of a relevant market under certain circumstances is not a violation of the antitrust laws. So if the Council wants to rely upon the antitrust laws to bail it out of a mess that it's beginning, it ain't going to work. It ain't going to be the antitrust laws that's going to bail you guys out if you put this one into place, it's going to have to be somebody else. Maybe the courts. Maybe Congress.

Finally, there is absolutely no justification for eliminating shucking at sea. Again, as just about everybody has said, there have been a lot of people here who have invested in processing boats and you're going to put them out of business just like that under a provision (which) has no conservation rationale attached here whatsoever. The only rationale is that it's going to help in some way lessen the enforcement burden on the government. Well, you don't put people out of business because it makes life easier for you. You've already heard a couple of different alternatives here as to how to do this. Some kind of meats per pound conversion to bushels seems to be a fairly easy way to do it. So prohibiting shucking at sea is not only short-sighted, but we think is probably legally suspect as well.

Now we also understand that there is a national standard that says that interrelated stocks of fish should be managed as a unit. And that's one of the rationales for throwing quahogs on top of surf clams. Well we feel first that you are not regulating it as a unit. You've got two different plans here, lots of different variations between quahogs and surf clams. So any argument that you're regulating it as a unit, we think is suspect to begin with. And moreover, even if you consider this a valid national standard part here, you've violated every other national standard in the statute. We think throwing quahogs on top of surf clams makes no sense whatsoever. The quahog resource has no history of shortages like the surf clam resource, there's no overcapitalization concern in the quahog resource, and there's no enforcement concern for quahogs. So why regulate them exactly the same it makes no sense whatsoever. We feel that of all the schemes putting quahogs into it is the most arbitrary and capricious and legally suspect part of the hearing draft.

Turning to surf clams for a moment. The same arguments can be made with respect to efficiency, anti-competitiveness, threat of foreign takeover, shucking at sea--all those are equally applicable to, we think to surf clams. Let me go over a couple of other points however, under the national standards.

Conservation. Is there a conservation rationale for surf clams right now? In the FMP under Amendment number 7, apparently if you look at the data the fishery has been conserved and managed very well. As the Council members stated at the April 13, 1988, hearing, "the surf clam fishery can be accurately forecast for the next ten years and is in no danger of depletion." Again, why blow apart with a nuclear weapon something that is not necessarily in need of being fixed? Surf clam landings have increased to 79 million pounds of shucked meats in 1986 from 39 million in 1979. Does that sound like a resource that's in danger of being depleted? Present stocks can support the fishery, almost everybody admits this, for the next ten years. In 1987 the surf clam catch was under the 1987 quota and apparently in 1988 it's the same. From a conservation standpoint this present system works more than well. There is absolutely no reason to go ahead and throw in an allocation system at this time.

Equity and fairness. Again a per-vessel history based system is unfair and inequitable as proposed. Again fishermen are not being rewarded. It is, boats which are the key to the scheme. The vessels are the key to the scheme, and we think any time that you focus on vessels rather than the fishermen that have been in the industry you are running across serious problems. In fact, under your scheme a fisherman with a boat in service for one year could find his yearly allocation cut to one-tenth of a single year's reported catch. Now I don't think that's fair and equitable, nor do I think anybody could stay in business under those circumstances. And there are people who will have to go to court to fight this thing. People who would be put out of business immediately if this scheme went into effect.

So you are really just asking for a battle against what appears to be a united industry. I don't think this Council has ever seen an industry so united against a scheme. Why is the Council continuing to push something which the entire industry is fighting? It's beyond me. I don't know where this is coming from, but obviously I've got to congratulate you all on drafting a document that's about as thick, maybe as boring, as I've ever read, but as thick as I've ever read. It's an incredible amount of work that has been put in by the Council. And

I congratulate you on that, but I also think that it's misdirected work effort. Obviously, you feel there is something going on here that the rest of industry doesn't know about.

One other point, I'll just make one other point on this inequity argument. It seems to me that what's going to happen is you could under this scheme have yearly allocation formulas that are less than a vessel can catch in a single trip. And there are numerous instances of the people that I have listed whose vessels will get an allocation that's less than they can presently catch in a one trip. If that isn't asking for trouble, I don't know what is. One of the major reasons that the Council is considering allocation as we understand it is ease of enforcement. It's clear that under this allocation scheme that you would shift enforcement from the sea to the dock. Now is that a good rationale for it? Would that lower the enforcement cost? We don't think so. We think you're still going to have to monitor quantity of surf clams. You may not have to measure time at sea as much as you did previously, but you are certainly going to have to monitor quantity, you're going have to look at cage tags, you are going to have to look at a whole lot of other enforcement issues and you're going to be put in a position where the people that you're regulating could well be put out of business by what you do and it's amazing how creative people can get when they are going to be put out of business by a government scheme.

Finally, there's one thing I would like clarified possibly in the Federal Register notice, if this ever does go to Federal Register notice. There is a vague reference here that violations of the Magnuson Act could result in lowered allocations. That's on page four of the draft. It seems to me that lowering somebody's allocation as an enforcement tool is both legally suspect, although I admit creative and I would love to hear about how that would be utilized.

Accordingly, we can't imagine why the Council would like to go ahead with this. There is no dire need for an allocation system. There's no fair and equitable method as proposed here that would fit within the National Standards and we think that they are completely flawed and that's the reason that I think your going to get just about everybody's whose speaking up on this thing going against. There is no valid conservation rationale for it. We think that this amendment is dead on arrival. We would like you to give it a fitting burial as soon as possible. Thank you.

Lee Anderson: Don Leonard.

Donald Leonard representing F/V Sea Transporter & Leprechaun (Attachment 3): Donald Leonard read a statement referred to the MAFMC Spring 1987 questionnaire, U.S.A. July 1988 questionnaire, Mr. Jensen's July 10, 1988, letter, Industry July 19, 1988 petition and Mr. Leonard's August 1988 letter to Chairman Martin to argue that Council has ignored industry input in developing the plan which therefore does not address industry concerns.

Lee Anderson: Thank you, Don. Bernie Rubin.

Bernie Rubin representing Chincoteague Seafood Co., Inc.(Attachment 4):

I just have a few comments for the record to restate positions that we have stated many times over the last three years and to summarize that position for my company and our boats.

None of the proposed alternatives as I have read them in the drafts are acceptable to our company. We have stated publicly for the record many times our opinion which is as follows: under no circumstances would we ever support an amendment that allows for combination of more than two permits of equal size and characteristics for surf clams. We would, as previously stated many times for the record, support an amendment which provides for the combination of two permits of equal size and characteristics on one vessel only. And to qualify that view, that is a subject that has been discussed many times over by the industry at many meetings. By in fact over 21 meetings that I have records of and minutes of. And it seems as though the combination of two permits on one vessel has a broad base of industry support. And for the simple basic mathematical and economic and moral factors that are so involved.

Simply if you take 144 vessels and you divide that by two that leaves you with 72 vessels, which stills gives the independent boat operator a chance to exist in some sense and survive in the future market. But when you go to further reducing as you suggest after a three year period then what you are doing is further dividing that and one more division of 72 is as I count it 36. One more on top of that 18. Now where is the rationale, the logic behind giving this resource of the allocated millions of pounds of meats to 18 boats?

Where is the logic and justification for United States public who is true owner of this resource? Not me, not any other member in this room. This resource belongs by birthright to the American public.

In closing, I would dare say that if you took a poll on the street and stopped 100 people and asked them if they would like to have the future of the clam products that they will consume controlled by a small handful of people, to provide the destiny and prices for their product, I would dare say that you would find an outraged and prompt reaction to the contrary. My comments are recorded on this letter. (submits letter for the record)

Lee Anderson: Thank you. Vernon Drewer.

Vernon Drewer: No comments. I think it's all been said.

Lee Anderson: James Farmer.

James Farmer representing Borden, Inc.: Mr. Chairman, my name is James Farmer, and I represent Borden, Inc., a New Jersey company with annual revenues in excess of $7 billion. Through its Clam Products Division, which does business under the Snow and Doxsee labels, Borden owns seven large fishing vessels with an annual catch which is expected to exceed one million bushels of clams in 1989. As a member in good standing of the Independent Shellfishing Association and the United Shell Fisherman's Association, Borden would like to go on record in total support of the comments which have been or will be made by these organizations in complete opposition to the proposed Amendment #8.

For the reasons that follow, Borden believes that it will be severely disadvantaged under any allocation formula which, like that recommended by the Staff in proposed Amendment #8, is based predominately upon historical fishing practices. Through 1986, Borden purchased at least 50% of its clam requirements from outside suppliers. In 1987, Borden made a decision to expand and improve its fleet, with the goal of harvesting all of its clam requirements with Borden boats. Since 1987, Borden has expended almost $2 million on new boats, including $750,000 on the recently purchased *Lisa Kim*. In addition, Borden has expanded approximately $500,000 in efficiency improvements to its existing boats.

As a result of these capital expenditures, totaling almost $2.5 million, Borden is now in a position to harvest close to 100% of its annual clam requirements. However, under all of the allocation formulas described in proposed Amendment #8, Borden would be prohibited, despite the aforesaid investment, from catching anywhere near 100% of its annual clam requirements. Based upon Borden's projected 1989 catch, if Borden were subjected to even the best of the proposed allocation formulas, the annual cost of clams to Borden would increase by $630,000 as a result of the quantity of clams that would have to be acquired form outside suppliers.

Furthermore, since the annual quahog allocations currently under consideration are based upon an annual quota of 6 million, Borden's annual allocation will be reduced substantially if said allocations are based upon a 5.2 million annual quota (such as this year's) or the 4 million annual quota which the Staff is rumored to have under consideration. In the event of such reduced annual quotas, Borden's annual cost of clams would increase dramatically and such cost increase would be reflected in the cost of clam products purchased by Borden's customers.

The historical based allocation formulas which have been recommended by the staff in proposed Amendment #8 for both the ocean quahog and surf clam fisheries, have a combined effect which is particularly burdensome on a company like Borden which over that past ten years has fished almost exclusively (98%) in the ocean quahog fishery due to adverse market conditions and catch restrictions in the surf clam fishery. As a result, Borden's allocation under any of the proposed surf clam formulas is minuscule, thus prohibiting the company from taking advantage of changing market conditions and increased supply in the surf clam fishery. This situation is exacerbated even further by the fact that all of the proposed surf clam allocation formulas, unlike the recommended quahog allocation formula, average in years in which vessels did not land any surf clams. Since each of Borden's vessels, on average, did not land any surf clams during three of the nine years under consideration in the allocation formulas, the effect of such averaging has a devastating effect on Borden, limiting each of its vessels to approximately one trip per year in the surf clam fishery.

In summary, Borden believes that Amendment #8 is an unnecessary and inappropriate solution to a "problem" which, in point of fact, is not a "problem" at all.

With regard to quahogs, the Staff has previously, and frequently, acknowledged that there does not appear to be any scientific information at this time indicating the quahog fishery is in jeopardy of being over-fished. Quite to the contrary, all available scientific information indicates that the quahog fishery is, if anything, being under-fished. Therefore, Borden believes that it is completely unnecessary and inappropriate to impose an allocation system in the quahog fishery, which would have an extremely detrimental economic impact on

fisherman who, like Borden, have invested large amounts of money to improve the size of their catch and the overall efficiency of their operation, in response to the current fishery management plan imposed by the Council.

With regard to surf clams, the Staff has failed to provide sufficient justification for replacing the current time-based fishing restrictions with an allocation system which severely disadvantages some fishermen. The proposed surf clam allocation formulas, which average all years, including years in which a vessel failed to fish for any surf clams, would arbitrarily prohibit vessels, like Borden's which have fished primarily in the quahog fishery during recent years from ever reentering the surf clam fishery.

The arbitrary nature of proposed Amendment #8 is dramatically underscored by the Staff's position on shucking at sea. Almost in passing, and without providing any meaningful justification, the Staff recommends that shucking at sea be banned. To date, Borden has expended $1.8 million in researching and perfecting shucking at sea. Although Borden is not currently utilizing this technology for economic reasons, at some point in the future shucking at sea may become the most economical means of processing clams and Borden would, therefore, like to maintain this option.

Since all of the available scientific evidence fails to support adoption of any of the allocation formulas contained in Amendment #8, and since such allocation formulas would have a devastating economic impact on Borden and many other fisherman, Borden submits that such allocation formulas cannot be supported under the standards set forth in the Magnuson Act and that, therefore, proposed Amendment #8 should be rejected in its entirety.

Lee Anderson: Wayne Watson.

Wayne Watson representing F/V Lady Kim, Mel Antone, Sea Quest, Kara Leigh:

First of all, I would like to say I would support a reasonable surf clam management plan or allocation system. But the only thing is how you come up with it. We've heard so many people saying how in the world, how they are going to be put down if there is such a system. So I think maybe right now we may have to look at it a little different. Go over this thing again. I don't know what in the world could be done to make everybody agree, because whatever you do somebody is going to get hurt with it. Especially the new boats to the industry or new boat owners that bought a boat that has no history, no history, no future livelihood with it.

The other thing on quahogs I think it's wrong timing to include quahogs in a management plan for an allocation system at this time because there are so many new vessels in the industry. I have one that's been in about three years. And the first two years you stay broke down a good part of the time. Going on history I would receive nothing out of it.

The other thing, the other comment I had to say is on the tagging system, from what I can understand reading and the hearing tonight, the tagging system it hasn't been mentioned either, but the tagging system would be kind of hard on crew members and a boat owner to tag those cages as they are being filled. I have one boat, the hold is about ten foot deep into her, ten, eleven feet maybe eleven feet deep. For a man to climb down into that hold each time these cages had to be tied or a cages was filled up, it would take an extra man just to do that on a trip. You take a surf clam trip with six hours to work. That would be very hard to do. We've always tagged our as they came off, we set them on the dock and a man is right there with tags putting them on the cages. And I think that's the reasonable way to do it. And if you put cages loose, if you put clams loose on deck or in the hold, you cannot tag them until they are filled at the dock. I thank you.

Lee Anderson: Dave Wallace

Dave Wallace representing LeRoy and Martin Truex:

My name is Dave Wallace. I am here representing the Truexes, who are own and operate 18 federally permitted surf clam vessels for the Mid-Atlantic. They wish to express their total opposition to Amendment 8 as written for the following reasons: First of all Amendment 8 is entirely too complex. Under normal circumstances, we deal with one fairly clear fairly concisely worded proposed new regulation for an FMP. In this particular case, we have nine different formulas controlling the destiny of all the fishermen and all the vessels both in the surf clam fishery and the ocean quahog fishery. This is unrealistic and puts the burden of the industry in the hands of the Council and the Council staff and ultimately the National Marine Fisheries Service in determining which group of formulas they would implement. Therefore this takes any of the true decision making process out of industry's hands.

In the past industry has always met, gone through the arduous process of determining what amendment should be made to the plan. They arrived at a consensus among the majority of the industry, which was written in very closely worded language. As long as they don't change any of the wording, the consensus will hold. And that goes through the process and it's implemented. In this particular case, after being obviously irritated with the disagreements in the industry and having industry in fact develop a consensus which did not suit one industry participant, that participant took it to the Council chairman, who decided to override any consideration of industry's consensus. The Council decided to place a plan before industry with no consensus.

As a matter of fact, it was noted that this is probably dead on arrival. I would have to think that that's correct. You combine both surf clams and ocean quahogs into one overall plan. That's sure to bring you a lot of support in New England. That's good. As in Philadelphia, what I think you are going to here is that that's not going to happen and what you've really done is built a mouse trap and caught the Council.

In Philadelphia we had a consensus, the consensus was: limited consolidation; a moratorium on ocean quahog vessels; and get rid of some of the vessels so that we could put together a vessel allocation plan that the rest of the remaining participants could live with. That was chosen, but the Council in its infinite wisdom chose not to do that. Therefore we have gone to public hearing with this very complex plan, which no one is capable of understanding all of its ramifications especially as how it affects New England and how the New England portion of this plan affects the Mid-Atlantic surf clams. In short this has become far too complex and there are far too many unknowns and no one in their right mind would take their life's earnings and take it to a casino in Atlantic City and put it all up on the craps table and take the dice and roll it once. This is what's being proposed at this time.

There is only one thing that is obvious, there are too many vessels chasing too few dollars. If you increase the quota, you reduce the dollars per unit so until you can get the consumer to buy more and make it such a wholesome and wonderful prices, there's just not enough dollars to support all these vessels. The only way to do that is through limited consolidation. Thank you.

Lee Anderson: Bill McElwain.

Bill McElwain, Shellfish Seafoods Limited:

I represent Shellfish Seafoods Limited as a processor. I would just like to agree with everything I've heard so far and voice Shellfish Seafood's total opposition to Amendment 8 as proposed. I won't go into all the reasons. I really didn't hear any arguments that I really couldn't buy myself, or wish I hadn't said. We're just totally opposed to it. I think the last argument on a crap shoot or a crap roll is the nicest. Thank you.

Lee Anderson: Thank you. That's the end of the written list. Is there anybody who has not signed who wants to speak?

Dick Myers representing Myers Clam Company:

Dick Myers, Myers Clam Company. I won't tell you how many boats I own because Bill Gifford just outdid me terribly. (laughter) But I agree with what mostly has been said here tonight. We are all against allocating quahogs. I believe that shucking quahogs at sea is the only way the future will allow us to do it. I also believe that consolidation, which I proposed two and a half years ago to get rid of the old boats and make the fleet smaller again is the only way to go.

But I also agree that we are living under too many regulations now, picking six trips in a quarter, ten days or two weeks or three months in advance, not being able to cancel those trips. They are forcing us to work in all kinds of bad weather. Especially these old junk boats that some of us got. I think it's a big hazard to the fishermen.

I believe there should be some kind of an allocation system. I don't know whether it should be history or cube or half and half or whatever. But I do believe there should be some kind of an allocation system so that we can pick out trips like we used to do. When I used to run the boats, we went when the weather was fit. We stayed as long as we wanted. We caught our trip and came home.

I heard some remarks a while back, that one guy is only going to get one trip in a year. Well, with 2,650,000 bushel you only need about four boats to catch 'em all. Because I caught 500,000 bushel with one boat in one year, and so did John Roberts. That was before the regulations. So we got to reduce the size of the fleet.

We got to make fishing conditions more safe for our fishermen. I think that's the most outstanding thing to consider. I hate these regulations where everybody tries to make you into a crook. You got to steal 15 min-

utes before time and 15 minutes after time, this and that and the other thing. It's ridiculous, to have to work under these regulations.

Somebody proposed a while back that if you pick whatever system suits you the best. If cube suits you the best, you pick that for yourself. If history suits you the best, you pick that. And we might have to raise the allocation to three million to cover it. I don't know. But I definitely think first of all we need limited consolidation and secondly we need an allocation system of some kind to get rid of these pick your days, pick your hours.

And the 50 clams under four and three quarter inches that the staff proposes is ridiculous. I mean, when you got four inch clams, 32 bushel in a cage you got about 3500 clams in that cage. And to have 50 clams out of 3500 under four and three quarter inches is impossible. You can't get sort machines to sort that good. That's just one little thing. You know maybe it should be a thousand. But that's the comments I have as an old time clam catcher and processor. Thank you.

Lee Anderson: Thank you, Dick. Is there anyone else? Yes.

Kim Marvin representing American Original:

My name is Kim Marvin and I am here representing American Original. We now own zero boats. We're I guess at the bottom of the totem pole from that standpoint. But it's a rare occasion, but we agree with a lot of the things that Dick Myers just said.

There are a lot of problems with Amendment 8. We think that the environmental groups are pushing the land based shucking plants into the ocean and this is going to be the future of the industry. The only really viable way to take the meat out of the shell. We think that it doesn't make a lot of sense to regulate quahogs and to grant rights to a specie that has never been fully utilized. We can't understand that.

But we think the overall big picture of Amendment 8 is absolutely necessary because we are an industry that's deteriorating. That it doesn't really have an organized way to replenish the investment. We are getting older boats that aren't going to be efficient versus other alternative seafoods.

We've had a lot of years to look at how the different factors in the industry perform in different situations. You know, we've had periods where the yields are very low. We've had periods where the yields are very high. We've had periods where there are too many clams. We've had periods where there are not enough clams. I don't' think we've seen any situation twice. I think we are getting ready to see some situations twice. It's looking more and more like the conditions that the whole management scheme started under, a period where we didn't have a lot of new clams and old clams were big and full of meat, but began to get harder and harder to catch. We think that there's a valid basis for looking back at just how everyone competed in the industry and trying to make some type of a fair model to allocate these rights so we can get some new boats. We can shuck the clams in the ocean, where efficiency tells us they should be shucked and we can do it with some reasonable assurance that we're not spending money on something that's going to be changed a year or two down the road. That's all I have to say.

Lee Anderson: Anyone else? Last call for an opportunity to get on the record.

For those who haven't heard, the Galilee hearing that was originally scheduled for March 1 has been moved to March 8. It's just one week later. Please make note of that.

The hearing has been taped recorded. The tapes will be filed as an official formal transcript of the proceedings and summary minutes will be prepared on the hearing. Thank you for coming to the hearing and for giving us your comments. Please be assured that we will consider your comments before preparing a final version of the Plan. Thank you for coming.

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The hearing began at 7:00 pm. MAFMC member Lee Anderson was the moderator. Others present included Bruce Freeman (MAFMC), David Keifer (MAFMC staff), Clay Heaton (MAFMC staff), Jack Terrill (NMFS) and 20 members of the public.

Lee Anderson reviewed the procedures for the hearing. He stated the Amendment was prepared by the Mid-Atlantic Council in consultation with the National Marine Fisheries Service under the authority of and pursu-

ant to Title III, section 303 of the Magnuson Fishery Conservation and Management Act of 1976. The Council prepared Amendment #8 in response to the needs identified by the industry. Among those needs were:

1. individual annual allocations that a fisherman could take when he wanted to.
2. Relief from excessive regulation (for example, hours per quarter set in advance).
3. Rules that would allow for safer operation.

The Council, in preparing this Amendment, took into account the stated needs and problems of fishermen and have addressed them in a manner that it believes is both legal and the most fair to the varying interests in the fishery.

You should comment on what you consider positive aspects of the Amendment as well as what you consider negative aspects, stating your reasons for each.

The hearing will be conducted in the following manner: First, Mr. Keifer of the Mid-Atlantic Council staff will present a summary of the Plan. Then you will be invited to comment on any aspect of the Plan. All comments will be recorded by staff and will become part of the permanent record. Your comments will be supplied both to the Councils and to the National Marine Fisheries Service for their consideration. We ask that you limit your comments to the provisions of the Plan, Environmental Assessment, Regulatory Impact Review, and proposed regulations. We are here to record your comments and to answer questions relating to these documents and not to debate other issues. Each person will be given an opportunity to speak for the record. Please try to keep your comments brief and to the point.

Dave Keifer will now present the draft Amendment (Attachment 1).

Lee Anderson: We will now open the hearing for your comments. In making your statements, please speak loud and clear so that we may record your comments for the record. Please remember that we are interested in learning why you favor or oppose a particular measure or a particular part of a measure. The Plan must meet the standards in the Magnuson Act, which means that we must explain the reasons for and the impacts of each measure. Also please state your name for the record and the name of any organization for which you may be acting as an official spokesman. We have small microphones here on the table so I'd appreciate it when you make your presentation you could walk closer to the table to make sure that your comments are picked up. The first speaker is Gene Janowski.

Gene Janowski (Attachment 5): Gene Janowski, representing Borden, Inc., read a statement that Borden believes it would be severely disadvantaged under any allocation formula which is based on historical fishing practices and that the ban on shucking at sea would arbitrarily prevent companies like Borden from choosing this option in the future.

Lee Anderson: Thank you. Mr. Schneider.

Jeffrey Schneider:

My name is Jeff Schneider I'm an attorney from Washington, D.C. with the law firm of Hogan and Hartson, and I am here to represent the Independent Shellfishing Association. Mr. Jonathan Kahan spoke on our behalf at the February 22 public hearing and we submitted written comments at that time, which we expect would be part of the record. I want to thank you for permitting me to present some further views of the I.S.A.

The I.S.A. was formed solely to respond to Amendment 8. The group consists of: Max Cohen, R.D. Dempsey, Donald DeMusz, Bill Gifford, Harry Higbee, Tom Keenan, Frank Marriner, Charles McCullough, James Pearson, Dick Shaw, Barney Truex, Martin Truex, Wilbur Wiseman, Borden, Inc., Gortons Canned Seafood, and Sea Watch International, and since last week, Mid-Atlantic Food, Inc. We seem to be growing all the time. The group represents every possible segment of this (industry).

For the past couple of years the annual quota hasn't been caught. The quota has been raised by NOAA over the previous several years. The resource is expanding and no one has provided any scientific evidence that there is a shortage in the quahog resource. Until and unless you can provide such evidence, you shouldn't be moving to an allocation plan. There's no conservation rationale. Similarly in the surf clam resource, there is no conservation rationale. The present amendment and the Fishery Management Plan has worked very well to replenish the resource from the depleted state that it was in ten years ago and, again, the annual quotas are not being met. And that's evidence enough that there's no conservation rationale for any allocation.

Second, efficiency: Allocations do not promote efficiency in the resource. They promote inefficiency because they kill incentive and competition. Anyone who is versed in rudimentary economics knows that when you destroy competition you removed incentives to compete and you remove all incentives to fish efficiently. Under the present system, under the system proposed by the Council, there will be no incentive for a fisherman to modernize or to build a better mousetrap to increase their catch-per-hour fished, and therefore, to reduce their costs and the cost to the consumer. Simply put, the allocation does not promote efficiency.

The Plan also does not minimize administration costs, especially for the quahog industry. It dramatically increases costs. The quahog fishery is virtually outside the regulatory scheme right now. There are no costs. There is no cost for administration. There's no enforcement costs and if the Council is so concerned about enforcement costs, as they have claimed to be in the development of this plan, they should take notice of the fact that they are going to dramatically increase enforcement costs if they put a quahog allocation into place. There is simply no enforcement costs right now, if you put an allocation system in you are going to have to have NMFS officials on shore checking the cages. You're going to have administration costs in figuring out the allocations, and paper work associated with the transfers, and again the checking of cages and making sure nobody's cheating the system or exceeding their allocation.

There is no scientific data support for allocations. We've talked about that already. There is no scientific data supporting any conservation rationale.

Now admittedly, the Standards also require where possible that interrelated stocks be managed as a unit. However, in this case the stocks will not be managed as a unit. You are not talking about putting the same formulas in for quahogs and surf clams. You've got different formulas, you've got different transfer schemes. One can be transferred. Under quahogs, you can transfer allocations immediately but in surf clams, not for three years. You are not managing them as a unit, so there's no efficiencies in administration there. They're not the same market. They're not the same price when you go to market. Again, you're just not managing them as unit.

Now I would like to focus especially on National Standard number four because this standard is the key to the whole plan. It talks about allocations and it will be violated by the proposed Plan. The standard states that "allocations must be fair and equitable and must not give individual entities an excessive share of the allocation." The Plan proposed by the Council is simply not fair or equitable. It focuses on vessels, not fishermen. So it fails to reward those it intends to reward and it rewards those it does not intend to reward. Some fishermen who have been in business for many, many years receive minuscule allocations under all the proposed formulas. And newcomers who've purchased vessels with good histories will prosper under the plan. To give you an example of that, Mr. Gifford, one of my clients, recently purchased American Original's entire fleet. They have perhaps the best allocation numbers under most of your different formulas. It's a good thing that he purchased it, because he's been in this industry for many, many years and he deserves to have a good allocation. But I could purchase the fleet from him tomorrow. I've had not a day's experience in this industry and I would have the best numbers in the fishery. That's not fair and equitable. That's arbitrary and capricious and it violates the standards. I'll give you an example from the quahog allocation schemes, especially the average of years fished example recommended by Council staff. We put this example in our paper and I hope you all read it. Under that scheme, two fishermen could fish for exactly the same amount of time. Suppose they both fished exactly for one year out of the ten. They fish exactly the same amount of time, they catch exactly the amount of fish, but one of them fishes from January 1 to December 31 and one of them fishes from January 2 to January 1 of the next year--same amount of time, same amount of fishing, one day difference in schedule, and the second guy gets half the allocation of the first guy. Is that fair and equitable? No. Arbitrary and capricious. It doesn't accord with the standards.

And finally the proposed formulas could drive a fisherman out of business as was talked about before, for there are many people who have poured in a lot of money. You've heard Borden's representatives talk about their investments in the industry and any time you have a formula that's going to put people out of business without a conservation rationale, you're talking about a system that is not fair and equitable--arbitrary and capricious.

Let's turn to the second part of Standard Number Four, entities not receiving excessive shares. The proposed formula will give excessive shares to individual entities. Nothing in the Plan prevents a single entity or a few entities from purchasing the entire annual quota in either fishery. In fact, the Plan encourages this since no effort is required to control the resource, only dollars. You don't have to be a good fisherman to get 100 percent of the quahog fishery, you only have to be a wealthy one. The Council and NOAA's General Counsel have argued that existing anti-trust laws will prevent massive consolidation and will prevent entities from ac-

quiring excessive shares. This is ludicrous. First of all, the Supreme Court has recently said that anti-trust laws may not apply to situations where the government adopts a regulatory policy in a regulated industry that permits anti-competitive conduct by private parties. And have your attorneys look at the law very carefully before you rely on anti-trust laws that may not even apply to this entire industry. And even if the anti-trust laws do apply to the surf clam and ocean industry, there's no guarantees that such laws will prevent purchases of the entire allocation by a single entity or a small number of entities. Our written comments contain a number of cases and we could find more. The courts have found that huge market shares, in one case a hundred percent, have not violated anti-trust laws. And these are the cases that get to court, which doesn't happen very often these days. In the last eight to twelve years, parties relying on government enforcement of anti-trust laws have been sorely disappointed. I will give you a few anecdotal comments about that. Peter Rodino, Congressman of New Jersey, has noted that the failure of government agencies to enforce anti-trust laws has been a key factor in the massive increase in hostile corporate takeovers. A January 14, 1989, article in Legal Affairs, noted the Administration's deemphasis in anti-trust enforcement and quoted a prominent Washington anti-trust attorney saying that the federal government has increasingly refrained from enforcing anti-trust laws for the last 12 years. The chairman of the Iowa House Agriculture Committee, noting lack of government anti-trust enforcement in the meat packing industry has been quoted as saying, and I quote, "the Reagan Administration has simply stopped obeying the law, they have not pursued any anti-trust, no matter what" end of quote. In the airline industry, the government has stood idly by while mergers have two-thirds of all domestic flights in the hands of eight carriers. Sheer numbers tell the story as well as anecdotal information. Between 1981 and 1987 the Justice Department challenged only 276 of 10,723 merger applications. Columbia University law professor, Harvey Goldsmith, has been quoted as saying, and I am quoting now again, "We'll be paying the price for the laissez faire attitude of the Administration for the rest of the century. In large part we can't draw back from the horizontal concentration problems that the Administration has created" end of quote.

I could go on and I would be happy to, but I think the picture is clear. Industry participants, especially the small independent cannot and must not be expected to rely on federal anti-trust enforcement to prevent the massive consolidation of this industry that would result from Amendment number 8.

The National Standards also prohibit allocation solely to achieve economic goals. The quahog allocation proposed by Council blatantly violates the standard. There is no conservation rationale, we've talked about that. There are no safety concerns in the industry, because nobody is being restricted by the amount of time and the days they can fish. There's no enforcement rationale, because there's no enforcement right now. It's outside the regulatory scheme. The only possible justification for a quahog allocation is overcapitalization in this industry and that's clearly an economic issue. The Council staff is well aware of the (lack of a justification for a) quahog allocation, therefore it violates this part of the Magnuson Act. The Council knows it. Industry knows it. And if the Council persists in pushing the Plan, Congress and the courts will know it as well.

Reducing allocation as a penalty: I don't know how many of industry members in the room are aware of this. It seems to be sort of injected into the hearing draft inconspicuously. But the Council plans to reduce people's allocation for violating the rules. If you're caught without a tag, if you're caught with undersized clams, or in any other way violate the allocation scheme, the Council plans to reduce your allocation. It's not clear that this is a legal policy and it's not clear that this is part of the Plan that has had any kind of discussion at all or been through any kind of due process.

Finally, as Mr. Kahan pointed out, there is no rationale for the provision prohibiting shucking at sea. There's no enforcement rationale. The Council staff admitted in Philadelphia meeting in July that it's easy to devise a formula converting weights of shucked and unshucked shellfish. The plan to prohibit shucking is in direct conflict with environmental regulations which are moving toward the prohibition of onshore shucking. This provision ignores clear (evidence of) investment in shucking boats. It would cost fishermen millions in useless investments and there's no purpose behind it.

I would now would like to very quickly, and I apologize for not being brief, I would like now to turn to some additional points not stressed by Mr. Kahan at the February 22 public hearing.

One, the cage tag system: As Mr. Watson pointed out in Pocomoke, the logistics of tagging cages has not been properly thought out by the Council. It would be very difficult for many vessel owners to cage and tag shellfish onboard ship as they are being caught. Under the proposed plan, cage tagging will require extra crew and will slow fishing operations considerably, adding additional costs to industry and ultimately to the consumer.

Second, cost to consumers of monopoly or oligopoly pricing: As anyone with the most basic understanding of economics knows, monopolies and oligopolies can control prices to create higher prices for consumers. Amendment number eight, by virtue of the fact that it would inevitably would lead to massive consolidation, would result in higher prices for consumers and monopoly profits for a few selected fishermen in the very near future.

Safety: As Dick Myers pointed out at the February 22 public hearing, there are some safety concerns with the current F.M.P. Fishermen are now encouraged to fish for surf clams on bad weather days. However, an allocation system is not necessary to address this problem. All that is required is a loosening of restrictions on scheduling and make-up days so that fishermen do not feel forced to fish in bad weather. In fact, Amendment 8 has its own safety problems, since it destroys all incentives for fishermen to modernize their vessels. No modernization can ever result in increased allocation, so fishermen will be encouraged to continue to utilize old dilapidated and unsafe hulls.

No phase-in period: This is a fairness and equity problem. When the Council instituted the time based system, it encouraged fishermen to remove vessels from use and to modernize them. Many fishermen invested millions of dollars in modernization development, again you've heard about Borden's investment in response to these incentives, and they are going to suffer as a result because their vessels were out of service and have a poor history. In addition, many quahog fishermen have constructed new, modern vessels based on the current plan which allows them to come into the fishery and these vessels will have no history at all. These people could go bankrupt if Amendment 8 is enacted.

Now some of these problems could be alleviated if there were type of phase-in plan involved in Amendment 8 to avoid the drastic consequences of suddenly altering the management scheme. But no such phase-in is in the plan. It doesn't move to allocation gradually over time and it doesn't attempt to anyway account for those who reasonably responded to the incentives of the current system put in place by the Council.

Finally, the formulas are not current. The Magnuson Act requires all management plans to take into account, quote, "present participation in the fishery," unquote. Unfortunately, none of the history based formulas takes present participation into account. None of the formulas includes data past 1987, even though the Amendment will go into effect at earliest in 1990. Thus even if Amendment 8 was otherwise legally acceptable, which it is not, it fails to conform to the Magnuson Act because it fails include present participation data from 88 and 89.

One more. Threat of foreign control. Because the allocations are so freely transferable and because no investment other than cash is needed to purchase allocations, it would be easy for foreign controlled companies to purchase huge portions of the surf clam and quahog resource. Already there are significant foreign inroads into this fishery and under Amendment number 8 there would be no stopping the floodgates. I am sure Congress would be shocked to discover how soon and how easily the entire fishery could fall into a few foreign hands under this amendment. And as I noted earlier, anti-trust are not a sufficient deterrent to prevent this from happening.

In sum, Amendment 8 is rife with problems. I've only touched on a few today. Other speakers at the Pocomoke hearing have discussed others and the written comments submitted by both by our group and by others have addressed still more. Mr. Bryson asked us informally after the last hearing whether there was anything we liked about the Plan. We liked the cover design of the document. Actually, we're heartened by the fact that the Council recognizes that there are some safety and overcapitalization problems in the industry. But the cure offered by this amendment is worst than the disease and everyone recognizes this fact. Indeed, from a conservation standpoint, the amendment number 7 has worked very well. That's why our group and U.S.A., United Shellfishermen's Association, which together comprise approximately 90 percent of this industry totally oppose the amendment. And that is why almost every speaker at the February 22 meeting opposed the Plan. Even the two speakers who expressed some limited support for the Amendment at the Pocomoke hearing opposed the quahog allocations and opposed the shucking prohibition.

My fear at this juncture is that these things tend to develop a momentum of there own. We've seen that. And worry that the overwhelming voice of industry will again be ignored. I worry because industry has been ignored in the past and I worry because I think the Council is tired of dealing with this problem and wants to move to a conclusion. And I worry because Council staff which has been very influential in this process and has put a great deal of time and effort into the formation of this amendment and now has a vested interest in seeing it go forward. But I ask the Council to take a step back and recognize the amendment is flawed, inequitable, unreasonable, arbitrary, capricious, and not in conformance with the National Standards under

the Magnuson Act. And I ask that we scratch the plan and start over in a spirit of cooperation to work together to address the legitimate concerns facing the industry. Thank you.

Lee Anderson: Thank you. Joe Garvilla.

Joe Garvilla: My name is Joe Garvilla. I'm here representing the United Shellfish Association. United Shellfish Association has voted to oppose Amendment 8 because it penalizes the majority of our membership. It allows for the consolidation of surf clam and quahog permits and it calls for a quahog allocation and a ban at shucking at sea. These are a few of problems U.S.A. membership has with Amendment 8.

Lee Anderson: Mr. Wallace.

David Wallace:

My name is Dave Wallace. I am here representing Shellfish, Seafood, Shellfish Vessels and the Truex fleet, which consists of 19 Mid-Atlantic surf clam permitted vessels. The Truex fleet and Shellfish Seafoods wish to emphatically reject the notion that Amendment 8 at this time in its present form should go forward. In Philadelphia the industry developed a consensus which said that there should be limited consolidation and a moratorium on ocean quahog vessels. The Council staff or the Council chose to vote to go to public hearing with Amendment 8 as it stands--with nine different proposed alternative formulas. The industry within itself has always worked out in precise detail what the formula was going to be in advance therefore recommending to the surf clam committee a given proposed regulation. The Committee then took that basic information, modified it within certain guidelines sent it on to the Council. The Council then would approve it and go to public hearing. They would have the consensus continue to support the Plan. It would go to NMFS. There would be support there from industry and it would go forward.

We have a severe problem here. Industry violently opposes Amendment 8 as it's written. We've been trying to tell the Council this for a long time. For some reason, through frustration or what have you, the Council decided not to listen. We respectfully request that the Council listen to us. We oppose Amendment 8 because it's not going to work. It can't work. There are too many factions. Shucking at sea being a classic example of what should not have been in that plan. New England should have never been included. Allocation on ocean quahogs should never have been included. And then there should have been a real effort to find out what was a formula within the surf clam industry for the Mid-Atlantic surf clams that could be supported, which was not done. Therefore, what we need to do is to dispense with Amendment 8 and start over again using the Advisory Subpanel as the medium for input to the Surf Clam Committee of the Mid-Atlantic Council so as to attain limited consolidation and a moratorium on quahog vessels. Thank you.

Lee Anderson: Tom Alspach.

Tom Alspach:

My name is Tom Alspach and I am speaking tonight on behalf of Sea Watch International. Sea Watch is opposed to the entirety of Amendment 8 and we'll be submitting comments which will detail the basis for our opposition. This evening I would like just to address several points that we think are particularly important.

I think that the underlying problem that Sea Watch has with Amendment 8, and I believe it is the same problem that a number of participants in industry have with the proposed Amendment, is that it proposes to take what is now a national resource that all participants in this industry have the opportunity to fish for and can acquire the benefits of by virtue of their efforts. It proposes to take that natural resource and make it the private property of those individuals who have the financial ability to acquire that property. And there's a lot more to that than it seems. On the surface it may well appear that it could be to the short-term benefit of those individuals who presently have fishing permits because the fact that they have a permit would give them the ability to turn that permit into a commodity with a market value in one fell swoop. But you might ask yourselves, if that is so why there are so many fishermen who oppose this amendment as Sea Watch does. Sea Watch has some real concerns with the Amendment, but I have to tell you candidly, and I will make no bones about this, that Sea Watch at one point in time has given some very serious consideration to supporting this amendment. And the reasons that Sea Watch could support the amendment I think have nothing to do with the conservation aspects of what you propose. But if as a practical matter the Amendment is adopted, and if regulation of the fishery is to become a game of who can exercise the most financial clout in order to control a larger share of the market, then Sea Watch is prepared to play that game as well.

I notice that the proposed regulations include a provision which would purport to eliminate the ability of a foreign nation to control or to own a transferable permit. And I suspect that was probably put in there for the purpose of seeming to prevent a foreign owned company, such as Sea Watch, or a Canadian owned com-

pany, such as American Original, from gaining control of the permit. That's not going to work. There are several problems with it. In the first place I think you've got a serious Constitutional problem in the federal Constitution with attempting to restrict the rights and privileges of resident aliens in this country. I won't address that in detail now. We're researching that and that will be addressed in our written comments. And I think that you will find that there are very strict limits on the Council's ability to preclude, for example, a Japanese member of Sea Watch's Board of Directors from owning a majority of this resource. As a practical matter, even if that were the case and if in fact the Council could ban foreign ownership of the resource, there are a multitude of practical ways through which our company could nicely avoid that regulation. There's no ability, for example, for the Council to prevent me, as a U.S. citizen and attorney for Sea Watch to borrow the money from the company to buy 50 or 60 percent of the market shares which would be available through the transfer of permits and then to enter into an agreement with Sea Watch pursuant to which they will effectively control the vast majority of the resource. And of course there are no limitations in reality on how much of the resource Sea Watch and American Original could control. I'll come back to that point at more toward the conclusion of my remarks.

So my point is that there are a lot of sound economic business reasons which one would think would motivate a company such as Sea Watch or American Original to want this amendment because it now would give us the opportunity without investing in vessels. Without having to put the money into fishing that most of the people in this room have put into fishing, to use our deep pockets and financial wherewithal effectively to make financial deals to control this resource effectively forevermore. And there are companies such as Sea Watch and American Original, and there are others out there--General Motors, for example. They could come in and buy this resource. They'd pay a lot of money up front for it, but if you're talking about controlling the resource for the next 20 years, how do you put a price tag on that? I think a lot of people have tried thinking about that right now, and by people I mean large corporations which will have a new found interest in investment in the seafood industry if this amendment comes to pass. So with all that in mind, one might question why Sea Watch opposes Amendment 8 and why the company is acting in a way that would seem to be adverse to its best economic financial and business interest. I will tell you that we do oppose Amendment 8. The reasons for that, from a business perspective, is that the company is comfortable with the relationships it now has with fishermen and wants to perpetuate those relationships. Sea Watch wants to see this industry remain basically a stable industry the way it is at the present time, comprised of groups of fishermen and processors who, while they have some differing interests, still on balance have as a goal the long-term perpetuation of an industry that provides benefits both for the fishermen and the processors alike. And does so, on fair terms, that does not give anyone an unfair advantage.

The informal talks that I've had with members of the Council and the Surf Clam Committee in recent weeks have left me somewhat perplexed. And the reason for that is that I've had many comments from members of the Council and Surf Clam Committee to the effect of, "Why are we hearing so much of this late opposition to the Amendment? Where were all these comments weeks and months ago?" My response to that is that someone just hasn't been listening. There have been some illusions to past history tonight and in a thumbnail sort of way, let me just remind the Hearing Board here of the history from the industry's point of view, which might give you some sense of why you're hearing so much negative commentary tonight as well as last week in Pocomoke.

You know, the industry was asked to help with the development of Amendment 8 and we spent a lot of time doing that. There was an Industry Panel put together. We spent a year and a half meeting at our own expense, not just at Council meetings but at meetings outside the context of the Council. And we came up with several recommendations that were presented at Atlantic City approximately two years ago this month. The one recommendation that, perhaps has the most relevance to Amendment 8 was the one that had to do with consolidation. And the vast majority of those on the Industry Panel, I think there was one, perhaps two dissenters out of 12 members of the Panel, was that the industry should move to what we've characterized as limited consolidation on a time based system whereby vessels which presently are making one trip could make two trips on the same permit. But it would still be on the basis of time. So that if you didn't take your trip, if you didn't go out to work and try to catch your share, to try to catch a portion of the quota, you would lose that opportunity. You wouldn't have some kind of vested right that you could sell to someone else. We made that recommendation and at some point in time thereafter someone on the Council and/or the staff jumped on this idea of the individual transferable quota which gave rise in my view to where we are tonight.

The industry panel continued to meet and at the meetings that were held before the Council, industry continued to oppose the idea of the I.T.Q, the transferable quota. And I won't take up your time tonight with the reasons for that. They are in the record. Most of it had to do with what's been alluded to tonight as the mas-

sive consolidation aspect of it whereby one, two, or some small number of fishermen or processors could basically buy all the resource and control it with the large economies of scale that would give them the ability to drive the others out of business. We finally culminated this discussion, we thought, at a meeting before the Council in Norfolk last spring at which time virtually everyone there spoke against the proposal of an I.T.Q. and the staff, we understood, was charged with the responsibility to come back to the Council with a new format for Amendment 8. That occurred in Philadelphia last summer, I forget whether it was July or August, but it was the Philadelphia meeting. And at that time we were surprised to find the proposal really hadn't changed at all. There was some tinkering with the formulas. There was a last minute effort at the meeting of the Council itself to include some additional calculation formulas in the so-called preferred alternative in order to assuage some of the various concerns that people had heard. But the concept of a transferable quota, immediately transferable for quahogs and transferable in three year for surf clams, was not abandoned.

And again at that meeting those of you who were there, probably everyone who's here tonight, heard the industry speak overwhelmingly in opposition to that proposed Amendment 8. You heard the Surf Clam Committee Chairman's letter read into the record. The comments that the Surf Clam Chairman made at that time arose primarily because of attendance at an Industry Panel meeting which we had convened a month before this Council meeting in an effort to try to come up with an alternative to what we saw Amendment 8 developing into. That was the panel meeting in which we were disappointed to be informed that we were not acting with the authority of the Council and that our recommendations would not be considered because we had not been asked to have that meeting. In any event, the Council with the lone dissent of Mr. Keene voted to put this Amendment 8 out to hearing despite the comments of the Committee Chairman, despite all the comments that were made at that meeting last summer.

So here we are and now we're back with the question of why is there such wide spread dissatisfaction of the Plan when there has been so much time spent in developing it. I sympathize with the amount of time the staff's put into this. I know it's been a lot of hours and a lot of effort and I know that the staff has been working in good faith. Nevertheless, somewhere along the line someone wasn't hearing or listening to what industry was saying because we went off in two different paths. Now, I have heard a number of people speak tonight about the substantive reasons, the policy reasons, why they do not feel Amendment 8 is in the best interest of industry as a whole. And I would endorse those views. I would endorse the views of Mr. Schneider, endorse the views of Mr. Wallace, and of Mr. Garvilla, which were elaborated on at the last meeting. And I am not going to take the time again to go through all those reasons why Sea Watch does not like Amendment 8. What I do want to touch on is a somewhat different issue and I have to request your indulgence because it's primarily a legal one, but I want to put it in the record.

I suppose it may be, I hope that I'm wrong. I hope that the Council will listen to what industry is saying. I hope the Council will recognize that what is called for now is a reconsideration of the direction we are going in and and that the Council will let industry get back involved in the process of working out some other arrangement to deal with the overcapitalization issue along the lines we were discussing a year and a half ago. But if that's not the case and Amendment 8 is pushed along in its present form, then I think these legal issues which I want to address briefly will have to be dealt with.

The primary one of those issues will require me once again to summarize the principle and, I think, underlying and fundamental difference between Amendment 8 and what the industry now operates on in terms of a fishing plan. You know, we're proposing to take what is now an opportunity to fish for the resource, a privilege to fish for the resource, and turn it into an actual distribution of the resource itself, which then can be sold and transferred among participants. And in my view and after looking at both the Magnuson Act and the Code of Federal Regulations which implements it, when the Council attempts to move from a Plan such as we presently have that allocates the opportunity to fish, that allocates the privilege to fish, and substitutes for that an allocation of the resource itself, it's my view that the Council runs afoul of the law. And I will just very briefly allude to some of the things which we will address in detail in our comments in writing. But I don't think my conclusion is very difficult to understand if you take the time to look at what the Code of Federal Regulations says in its National Standards that implement the Magnuson Act. If you take a look at section 602.14, which is National Standard 4, "Allocations", it becomes very apparent that they're not talking about allocations of the resource. There's not a single phrase in this National Standard anywhere in the discussion that follows the outline of the Standard itself which suggests in any way that Congress had in mind under allocations, the allocation of the clams themselves--the allocation of the resource. What they are talking about is an allocation of the privilege to fish. And they are very clear about that. The definition is set out in subsection c(1), "Definitions" where they tell you what an allocation is in the meaning of the Magnuson Act. It says, "an allocation of fishing privileges is a direct and deliberate distribution of the opportunity to

participate in the fishery." It goes on to reiterate that definition throughout that National Standard and it refers to an allocation of fishing privileges half a dozen times throughout.

Now where does the National Standard suggest that what they have in mind is an allocation of the resource itself? That's a radical idea. It's a departure from anything that's being practiced at the present time and it's our feeling that its not consistent with the law. And by the way, you may wish to take a look at National Standard 4 as well from the point I made earlier having to do with the ability of foreign nationals who reside in this country to own fishing permits. Under 602.14(b) they say very clearly that a fishery management plan may not differentiate among U.S. citizens, nationals, resident aliens, or corporations. And that is consistent, I believe with the Constitutional issue I raised at the outset having to do with what appears to be an effort to prevent foreign nationals from acquiring and controlling these proposed fishing permits.

I'm not going to take the time to walk you through this standard, it will be set out in our written comments. I will only point out that, in terms of National Standard 5 we come back to the same issue under limited access, where they discuss a system for imposing moratoria and so forth, limited access to the fishery, and again they talk about an allocation of fishing privileges and use the word "privileges" throughout. And when they refer to quotas in here, let me read this in context, it is pretty clear to me they are talking about quotas in terms of a cap or a ceiling on it, how much of a fishery a vessel or fisherman can take, not the actual distribution of the resource to that fisherman as a property right. It's primarily for this reason that, in reading through these standards I think it becomes apparent that the law does not contemplate the distribution of the resource itself to fishermen or to Sea Watch or to anyone else. General Motors or anybody else who might get the bright idea that here's a chance to grab this resource and own it for the rest of its regulated days and to control the prices at which it's bought and sold.

One final point, two final points I want to make. One final point has to do with an issue that was addressed a couple of the other speakers having to do with excessive shares. This has been a continuing concern of mine and some of you maybe have been at Council when I've been engaged in a dialog with Joel MacDonald about the third section of the National Standard, "to carry out any allocation of fishing privileges in a manner that prevents any corporation, individual or other entity from acquiring an excessive share of such privileges." It has been the position of legal counsel for the Mid-Atlantic Council that all this means is that after you divide the resource up, the anti-trust laws will crank in and the federal anti-laws are what we can look to prevent any one from an excessive share.

My first question on that point, I think is self evident. If all that this meant was that the federal anti-trust laws applied, what's the need for the language here at all? Congress does not put useless, unnecessary, unintentional language in its statutes. If all they meant was that the federal anti-trust laws will control the acquisition of excessive shares, they didn't have to put this language in there. The anti-trust laws were already federal law. You don't need to restate that. That means something else.

And what it means is set out in greater detail in the explanatory portions of the federal regulations where they go through and analysis of what the avoidance of an excessive shares actually means. And I will just quote one sentence. What it says is, "An allocation scheme must be designed to deter any person or other entity from acquiring an excessive share of fishing privileges and to avoid creating conditions fostering inordinate control by buyers or sellers that would otherwise not exist." What you're doing is precisely creating conditions that will foster inordinate control because you're proposing to make the resource freely transferable to my client, or by my client or by fishermen or by anyone else and you're not proposing to put any restraints on that except for (tape change) The federal anti-trust laws, as I was beginning to say would permit in this market perhaps a 50, 60, 70 percent market share by one entity.

I simply cannot agree to Counsel that the Mid-Atlantic's Council's only obligation is to come up with an initial distribution and then let the federal anti-trust laws take their course. I know that much of Amendment 8 is patterned after the New Zealand, and I know that Lee is one of them, who are familiar with the New Zealand model, know and understand that when this I.T.Q. concept has been put into practice elsewhere, they very carefully have limited the amount of control that any one entity can acquire to, I believe, 10 or 20 percent of the market. In addition, in the New Zealand model, the government gets involved and buys and sells shares to stabilize prices and prevent someone from acquiring excessive shares. None of those protections are built into this amendment and we don't think it's going to be productive, for the industry, for ourselves, or anyone else, for the Japanese and the Canadians, to get into a battle over who's going to control this resource, which is where this amendment is ultimately going to take us if this is what we end up with.

The final point I would like to make is that this shucking at sea concept that floated out of nowhere is perplexing to everybody in the industry that I've talked to. And it's more than perplexing to Sea Watch, it's a

great concern to us because Sea Watch is one of those companies which is faced with closure of its quahog shucking plant in Oyster, VA. It's public information that the company is working under an 18-month window, which is now probably down to 16 or 15 months within which the company must close down its plant in Oyster. Sea Watch cannot discharge into Oyster Harbor anymore, unless we want to dredge the whole harbor and recreate Oyster Harbor, which we're not going to do. Sea Watch has been in the process for the last several months at looking around for other opportunities, other locations at which they might be able to shuck. How that is going to come out is problematical at this point.

But by putting this shucking at sea ban in here, you're cutting off what is in long term the most likely and most conservation oriented alternative to deal with this tremendous problem of disposal of the waste on shore. Whereas at Oyster Harbor, where you have an enclosed body of water and it could be tremendously damaging to have the shucking waste water deposited into that enclosed body of water, at sea you don't have this problem. There's no other chemicals that are used in the shucking process other than sea water itself. It's the most natural way to eliminate the problem of discharge. It's the most logical way to go in the future, if we are going to avoid the continuing problems of environmental waste disposal onshore. I'm not saying it's the only alternative for the future, but it certainly is one that should not be set aside and eliminated because of its great importance in the industry solely because, as I understand it, there is some feeling that it would make enforcement easier under this contemplated Amendment 8 scheme of transferable quotas and cage tags. So I would ask you to look very carefully at the rationale for that and consider you've heard myself and others say tonight and other nights about the very important need for having shucking at sea remain available to all of us as a possible alternative for addressing our waste water problems. That's all.

Lee Anderson: Thank you, Tom. This concludes the number of people who have signed up. Does anyone, is there anyone in the room who did not sign who would wishes to make a comment at this time? Last call for anyone to make a comment for the record.

Please remember that the hearing that was scheduled for Galilee is one week later than was originally scheduled. It will be March 8, not March 1. Please also remember that written comment period ends March 31. If you have comments, please get them in.

This hearing has been tape recorded. The tapes will be filed as an official formal transcript of the proceedings. Summary minutes will be prepared on the hearing.

I want to thank you for coming to this hearing and for giving us your views. Please be assured that we will consider your comments before preparing a final version of this Plan. We will now close this hearing.

6 March 1989, Cape May Court House, NJ

The hearing began at 7:00 pm. MAFMC member Lee Anderson was the moderator. Others present included Dave Keifer and Chris Rogers (MAFMC staff), Jack Terrill (NMFS), and 37 members of the public.

Lee Anderson reviewed the procedures for the hearing. He stated the Amendment was prepared by the Mid-Atlantic Council in consultation with the National Marine Fisheries Service under the authority of and pursuant to Title III, section 303 of the Magnuson Fishery Conservation and Management Act of 1976. The Council prepared Amendment #8 in response to the needs identified by the industry. Among those needs were:

1. individual annual allocations that a fisherman could take when he wanted to.
2. Relief from excessive regulation (for example, hours per quarter set in advance).
3. Rules that would allow for safer operation.

The Council, in preparing this Amendment, took into account the stated needs and problems of fishermen and have addressed them in a manner that it believes is both legal and the most fair to the varying interests in the fishery.

You should comment on what you consider positive aspects of the Amendment as well as what you consider negative aspects, stating your reasons for each.

The hearing will be conducted in the following manner: First, Mr. Keifer of the Mid-Atlantic Council staff will present a summary of the Plan. Then you will be invited to comment on any aspect of the Plan. All comments will be recorded by staff and will become part of the permanent record. Your comments will be supplied both to the Councils and to the National Marine Fisheries Service for their consideration. We ask that you limit your comments to the provisions of the Plan, Environmental Assessment, Regulatory Impact Review, and

proposed regulations. We are here to record your comments and to answer questions relating to these documents and not to debate other issues. Each person will be given an opportunity to speak for the record. Please try to keep your comments brief and to the point.

Dave Keifer will now present the draft Amendment (Attachment 1).

Lee Anderson: We will now open the hearing for your comments. In making your statements, please speak loud and clear so that we may record your comments for the record. Please remember that we are interested in learning why you favor or oppose a particular measure or a particular part of a measure. The Plan must meet the standards in the Magnuson Act, which means that we must explain the reasons for and the impacts of each measure. Also please state your name for the record and the name of any organization for which you may be acting as an official spokesman. We have small microphones here on the table so I'd appreciate it when you make your presentation you could walk closer to the table to make sure that your comments are picked up. The first speaker is Mr. Garvilla.

Joe Garvilla: My name is Joe Garvilla, I represent the United Shellfish Association. I will give you three broad based, brief reasons why the U.S.A. is opposed to Amendment 8. First, it penalizes the majority of the membership. Second, it allows for the massive consolidation of surf clam and ocean quahog permits. And third, it calls for a quahog allocation and a ban on shucking at sea. These are few of the U.S.A.'s problems with Amendment. Thank you.

Lee Anderson: Mr. Wallace.

David Wallace: My name is Dave Wallace. I'm here representing the Truex fleet, which has 19 vessels, and Shellfish Seafoods, which is a processing plant. We wish to go on record as strongly opposing Amendment 8 for the following reasons. First of all, there is no clear concise formula on which the allocation of surf clams could be allocated. There are, between surf clams and ocean quahogs, nine different formulas. Therefore, we consider it foolhardy at best to advocate one, we can only oppose all of them. The second thing is that a we have always advocated a moratorium on ocean quahog vessels, no allocation of ocean quahogs and consolidation of the fleet. Number three, we have always felt that the only viable way to shuck ocean quahogs in the future was at sea and this Amendment to Surf Clam Management Plan disregards the practical problems completely. Number four, we feel that inclusion of New England area into this plan is a sure fire way to have complete opposition to it. In conclusion, we have always supported what was generally U.S.A.'s position and that was limited consolidation of surf clam permits and a moratorium on ocean quahog vessels. Thank you.

Lee Anderson: Thank you. Mr. Middleton.

Mark Middleton:

My name is Mark Middleton. I represent Winter Harbor Fisheries, a processor up in New York. At the risk of being repetitive, the person who spoke before me seems to have made all the obvious points that someone new to the hearing process like me would pick out to talk about.

I'm a processor and it may seem odd for me to speak out against the ban in Amendment 8 of processing at sea, but I think one of the big fallacies with this ban is that it's become more and more difficult to process on land given the environmental constraints today. It's something that you fellows should really deal with. It's getting to the point right now where several people that are in the processing game now are faced with a shut down as opposed to just looking for another place to go. There aren't any other places to go. It's not a compatible waste system. The effluent is not compatible with normal municipal waste systems. So it is getting to the point where the cost to process on land is becoming more and more difficult. That's just one thing.

These formulas are obviously very difficult to put together in any sensible train of thought at this point. It seems to me that there are so many of them that if something isn't broke, don't fix it. I think its just gonna end up being a situation where, instead of reducing the cost to the present system, it's going to be more difficult to enforce and at the same time I don't see any improvement on the conservation end of the existing plan. I don't see any conservation improvement involved in it at all.

Market place is something else I would like to address because I am on the end of it as a processor and I'm also having to sell it. It would seem to me that by enacting an allocation that you are going to throw the present pricing and marketing system right out the window. You're allowing, with this allocation system, the opportunity for somebody to gain such a massive control that pricing for anybody else that is not equal or better to that particular entity, whether it's a foreign corporation or a domestic corporation. You basically with this adoption are going to be shutting down the smaller end of the surf clam and or ocean quahog industry.

Those who gained a massive share of the quota could drastically dictate pricing. They could drastically work on the obvious seasonality of this game that we all deal with day in and day out. Regardless of your particular market, whether its fresh markets or long-term frozen or even canned, if they are going to be in it that big, they are going to be in a financial position to wait a lot of people out that are hurting in this industry. Which in turn adds to further massive consolidation. People who can't wait them out have got to fold. They just can't stand it to a point where they'll lose everything. These are my personal feelings. The other threat is, is if you do have market share, you're going to be in a compromised position, because you're going to have to fold your market share to someone who is waiting you out as far as the numbers are concerned.

There is a myriad of things I would like to address, but it seems to me that a lot of people have the same thoughts in mind. These are just a few that are obvious to me as a small line processor. Thank you.

Lee Anderson: Thank you. Mr. Alspach.

Tom Alspach:

My name is Tom Alspach and I represent Sea Watch International. I made some comments last week and I won't repeat those thoughts. I have some other points I want to put it in the record by way of public comments tonight. In particular, our concern is with the Plan's performance with the National Standard Number 4, which is outlined in section 9.2.1.4 the Hearing Draft on page 61. That's the standard, the legal standard, which says that conservation and management measures shall not discriminate between residents of different states and if it becomes necessary allocate or assign fishing privileges among fishermen, such allocations should be (a) fair and equitable; (b) reasonably calculated to promote conservation; and (c) carried out in such a manner that no particular entity acquires an excessive share. I'm paraphrasing it. That's a legal standard. That's the law and a plan is required to conform with that law. It was up here on the projector a little while ago. It's our belief that the Plan does not conform with this legal provision in a number of ways and failure to conform with this provision in only one way would be fatal to the Plan.

I just want to make a couple points on that. First, the Standard obviously refers to the allocation or assignment of fishing privileges among various United States fisherman. It does not say anything about giving the resource to various United States fishing vessels. All these allocation formulas are predicated entirely upon the notion that we are going to give the resource away to different vessels based upon either that vessel's fishing history or the size of that vessel or some combination there of. What the law has in mind is an allocation of privileges an opportunity to fish, among fishermen, not boats. There is not necessarily a relationship between the two because, as I think you've heard a number of people comment throughout the development of this Amendment, there are many instances in this industry where a particular fisherman, who under the law is the one who is entitled to allocation permit, has a very different history from what the vessel he owns may have. And, it's argued that, if you're going to have an allocation program that would conform with the law, it should be one that allocates the resource based upon an individual fisherman's history, if history is to be the criterion, rather than the history of the vessel.

The other aspect of the allocation of the resource by way of a quota, that would actually be transferable and could be sold at least in transfers that I don't think this has been brought up in the public hearing so far, at least I haven't heard it, is that there will be a significant dilution of the quota because of the fact that the so-called dead licenses the Council heard about for many months, will receive an allocation based upon history. And I'm sorry that my friend, Mike Parkowski, isn't here to go on this issue because it's been a major concern of his, but I think it is a real concern to the number of people in the fleet, because the vessels that have not been fishing for years and may be on the bottom, that may have left the fleet and have come back, but its for one reason or another its not being used. All these vessels would get a share of the quota which would be assigned to them, and that would take a portion of the quota away from the fishermen who are actively fishing, and have been actively fishing over the past two, three, four, five, years. Because of this aspect of the allocation plan, again no matter what the formula is, any formula will penalize some significant number of fishermen who's opportunity to fish will be reduced by that portion of the quota that is divided up and assigned to vessels that may not be participating in the fishery but may have had a history at some point in time.

The staff or the authors of the hearing draft have made an effort to demonstrate in the section that I referred to a few moments ago, 9.2.1.4, just how Amendment 8 as proposed would conform with the Nation Standard 4. One of the points that they make is the fact that the staff-preferred history-based allocation system, I am quoting from the draft now, "assigns shares based on performance so individuals should not gain or lose in terms of excessive shares relative to history". I made a few points on that topic a moment ago, but I think another point that should have been considered is the extent to which this so-called past performance, which is

the basis for the allocation system, has been tempered by violations of the regulations and by cheating in the past. I know a number of people in the industry have raised this problem with allocation formulas at various times in the last six to nine months. The response that I have heard from the Surf Clam committee has been twofold. First, everybody cheats and takes undersized clams and fishes ahead of time and violates the rules, so its not fair to single somebody out. And second, it would be virtually impossible to prove or to show who has taken unfair advantage the most times and there's is no practical way of factoring past violations and cheating into the question of allocating the quota.

I think that both of those rationales are incorrect. On the first point, while it may be fair to say that probably everyone in the room has gone 56 or 57 miles an hour in a 55 mile an hour zone, and therefore we've all broken the speed limit. That's quite different from some one, two, or three people in a group this size who may consistently drive 80 in a 55 mile an hour zone. And that's the group of individuals or industry participants who should be singled out for some scrutiny based on past cheating when your talking about giving the resource away. You know, its true that probably most, I won't say all, but I'm, sure that many people in the industry, both processors and fishermen have received violations for cheating. But there is a far cry between a violation here and there over the course of ten years and for example, running up three quarters of a million dollars worth of fishing violations as one entity in this industry has done, for small size, size limit, and fishing in the closed areas. The answer that I had heard given to that criticism is that the individuals or the corporations who have cheated in the past have already been penalized by fines levied against the particular catches that were seized or that were sent back by enforcement agents. But that really isn't the point, the point is if there are some participants in the industry who have engaged in these blatant violations and a pattern of cheating. That would suggest, I think, for a reasonable mind that there were many many more undetected violations and size limit problems and closed area problems that were not recognized, and were not caught, and fined. And yet the whole thrust of this Amendment now is to give those corporations or individuals a share of the resources as a piece of their property, in a magnitude which is based on a what they have done in the past. And if that past is been characterized by continued violations of the rules, they are going to be rewarded forever more because of those past violations of the rules. And those people in the industry who have tried to play by the rules, yes even if there's a violation here a violation there, but generally played by the rules, generally are going to have their share of the quota diluted by those who are getting a disproportionate amount because of cheating in the past. So we feel very strongly that some effort should have been made to take that history into account in preparing this Amendment.

Finally, one last point I'll make on this, then I'll go back to my seat. I noticed in the Hearing Draft, and I heard it quoted during the Hearing Body's presentation, that the staff believes the Council has conformed with the legal requirement that an allocation of fishing privileges not be carried out in such a way that any particular individual, corporation, or entity acquire excessive share of the privileges. I've spoken about the legal aspects of this last week, but I noticed that again in 9.2.1.4 of page 61 of the Hearing Draft which pretends to demonstrate that this requirement has been satisfied, all we have is the bald statement that the Council that, I'm quoting now, "The Council does not believe that the preferred alternative will create conditions fostering inordinate control by buyers and sellers that otherwise would not exist". I don't know why the Council believes this. There is nothing in the record that is in the nature of evidence or a factual basis for this belief. Certainly a system which will enable one corporate entity or individual to buy multiple shares of the resource will lead to more control then what exists at present. So on its face the statement is incorrect when it says the proposed alternative will not create or foster conditions that would not otherwise exist. Under the present system you don't have the ability to massively consolidate and massively acquire fishing rights and shares. It doesn't exist under the present system and most certainly would exist under the proposed system. There has been absolutely no effort in this Plan to try to limit or preclude any corporation or individual from controlling 50, 60, 70 percent of the resource indefinitely into the future. And for that reason among others, its our view that this Plan does not conform with the legal requirements of Standard 4. That's all.

Lee Anderson: That concludes the people who have signed up. Would any one else like to speak at this time. Please identify yourself for the mike, please.

Jeffrey Schneider (Attachment 6):

My name is Jeff Schneider from the law firm of Hogan and Hartson in Washington, D.C. and I represent the Independent Shellfishing Association. The group consists of Max Cohen, R. D. Dempsey, Don DeMusz, Bill Gifford, Harry Higbee, Thomas Keenan, Frank Mariner, Charles McCullough, James Pearson, Dick Shaw, Barney Truex, Martin Truex, Wilbur Wiseman, Borden, Inc., Gorton's Canned Seafood, Mid-Atlantic Foods, Inc., Sea Watch International. These are more or less in outline form my comments from last week, which I would like to put into the record. Which means that I won't bore you by repeating last week's speech, but I don't think

there is anything new here. Again, it seems to be that everybody who comes up and speaks totally opposes what the Council staff has suggested for Amendment 8. By my count now, only two people have expressed any support at all at any of the three public hearings who have come up to speak. Both of those individuals expressed qualified support only for the surf clam allocation and no support at all for the quahog allocation or the no shucking at sea provision. I don't really understand how the Council staff or the Council can proceed at this point with Amendment 8 given this whole-hearted industry opposition to the Plan. That's just talking in terms of numbers. People have spoken in terms of vessels and active fishermen, in terms of percentage of the catch. I know that our organization, and U.S.A., together probably count for 80 to 90 percent of the active fishery and both those organizations totally both oppose Amendment 8. Again I don't understand how Council or Council staff feels they can proceed at this juncture, given such overwhelming opposition.

I just want to say that I totally endorse the statements made tonight, especially made by Mr. Alspach. He seems to think that Amendment 8 runs afoul of National Standard Number 4. I seem to think that it runs afoul with virtually all the National Standards in that it doesn't promote conservation, efficiency, equity, ease of management, it doesn't take to count variations in the fishery enforcement or administrative problems, and so on. All of those things I've discussed last week, or Mr. Kahan did, in Pocomoke. And our written statements address that.

I just wanted to talk a little bit more about something Mr. Alspach mentioned last week which is that in his view allocation as used in the Act and in the regulations implementing the Act, does not mean allocation of the resource, it means allocation of fishing privileges. My reading of that is exactly the same as his, allocation is defined in the regulations as, quote,"a direct and deliberate distribution of the opportunity to participate in a fishery". The regulations also give examples of allocations: quotas by classes of vessels, quotas between commercial and recreational fishermen, different fishing seasons, assignment of ocean areas among different types of fishing gear, limited permits to present users. Those are referred to in the regulations as direct allocations. Now if those are direct allocations I don't know what it is that the Council is suggesting. It seems like they're taking an additional step going beyond allocating privileges, as all those examples discuss, to allocate actually part of the resource. There is no support whatsoever in the Act or in the regulations for such an action. None of the examples given by NOAA in the regulations talk about such a thing. It would be a unique and an unusual and, in our view, an illegal act, not in keeping with the Magnuson Act or with the regulations implementing that Act.

I want to say one last thing about shucking at sea. Also quoting directly now from the regulations implementing the Magnuson Act, "NOAA believes that a fishery management plan should not restrict the use of productive and cost-effective techniques of harvesting, processing or marketing unless such a restriction is necessary to achieve the conservation or social objectives of the FMP". Again, it doesn't seem clear to me how the prohibition against shucking falls within this. The prohibition against shucking has no conservation or social objectives. It only has an enforcement objective. The Council staff seems to believe that it would make it easier for the system to be enforced. Therefore, it doesn't fall within the meaning of the Act. It doesn't fall within this quotation in the regulations which says, we shouldn't restrict productive techniques of processing unless there is a conservation or social objective. That's about all I will say at this point, I'm sure I'll have more to say in Galilee. Thank you.

Lee Anderson: Thank you Mr. Schneider. Is there anyone else who would like to speak?

Mike LaVecchia:

My name is Mike LaVecchia. I represent Cape May Canners. I want to go on record to say that our company disapproves of this Amendment for two reasons. Number one, the way allotment goes, the way you allow the buying and selling of quota, I feel this would cause fluctuations in the price. It will show inconsistency in the market place. In other words, your prices would be high one day and lower the next depending on the demand for quota. Number two, we're a handshuck operation and the size limit would be lowered to four and three quarter inches, I believe, from the present size. That would just put us in a position where we wouldn't be able to shuck by hand anymore, we acquire large expenses by going to machines and it's just not possible for a smaller company to operate under these conditions. That's all I have to say, thank you.

Lee Anderson: Thank you.

Gene Janowski (Attachment 5):

Mr. Chairman, my name is Gene Janowski, and I represent Bordon Incorporated, a New Jersey company with annual revenues of $7 billion. Through its Clam Products Division, which does business under the Snow and

Doxsee labels, Bordens owns over seven large fishing vessels with an annual catch which is expected to exceed over seven million bushels in 1989. As a member of good standing of the Independent Shellfishing Association and the United Shellfishermen's Association, Borden would like to go on record of total support of the comments which have been made by these organizations in complete opposition of the proposed Amendment Number 8.

I would just like to make a few comments out of the text which I have submitted in the last several meetings. Since the annual quahog allocations currently under consideration are based upon an annual quota of six million, Borden's annual allocations would be reduced substantially if said allocations are based on a 5.2 million annual quota such as this years'. The quotas as outlined in the Draft are based on a six million allocation. With a 5.2 million annual quota, everyone's allocation would be reduced substantially. There are also rumors that this is to be lowered to possibly a four million annual quota, which is a drop of almost two million of what was originally proposed in the Proposed Draft. In the event of such a reduced annual quota, Borden's annual cost of clams would be increased dramatically and such cost increase would be reflected in the cost of clam product purchased by the Borden's customers.

Additionally, with regards to quahogs, staff has previously and frequently acknowledged that there does not appear to be any scientific information at this time indicating the quahog fishery is in jeopardy of being over fished. Quite to the contrary, all available scientific information indicates that the quahog fishery if anything, is being under fished. Therefore, Bordon believes that it is completely unnecessary and inappropriate to impose an allocation system and a quahog fishery which would have an extremely detrimental economic impact on fishermen who, like Bordon, have invested large amounts of money to improve the size of their catch and overall efficiency of their operations in response to the current Fishery Management Plan imposed by the Council.

Last but not least the arbitrary nature of the proposed Amendment 8 is dramatically underscored by the staff's position on shucking at sea. Almost in passing without providing any meaningful justification, the staff recommends that shucking at sea be banned. To date Bordon has expended over $1.8 million in researching and perfecting shucking at sea. Although Bordon is not currently utilizing this technology for economic reasons, at some point in the future shucking at sea may become the most economical means of processing clams and Bordon would therefore like to maintain this option.

The rest of the comments are contained in this draft which I will submit. Thank you.

Lee Anderson: Thank you. Any other speakers from the floor, please? We'll wait as long as anybody wants the opportunity to speak. I don't want to shut off debate. Seeing no one raising his hand, we will close the hearing. Please recall that we have a hearing in Galilee the day after tomorrow. Please also note that the period for written comment ends March 31.

Thanks for coming.

(hearing adjourned)

6 March 1989, Galilee, RI

The hearing began at 7:00 pm. MAFMC member, Lee Anderson was the moderator. Others present included Robert Smith and David Borden (NEFMC), Rick Ruis and Doug Marshall (NEFMC staff), Tom Hoff and Chris Rogers (MAFMC staff), Jack Terrill (NMFS), and 37 members of the public.

Lee Anderson reviewed the procedures for the hearing. He stated the Amendment was prepared by the Mid-Atlantic Council in consultation with the National Marine Fisheries Service under the authority of and pursuant to Title III, section 303 of the Magnuson Fishery Conservation and Management Act of 1976. The Council prepared Amendment #8 in response to the needs identified by the industry. Among those needs were:

1. Individual annual allocations that a fisherman could take when he wanted to.
2. Relief from excessive regulation (for example, hours per quarter set in advance).
3. Rules that would allow for safer operation.

The Council, in preparing this Amendment, took into account the stated needs and problems of fishermen and have addressed them in a manner that it believes is both legal and the most fair to the varying interests in the fishery.

You should comment on what you consider positive aspects of the Amendment as well as what you consider negative aspects, stating your reasons for each.

The hearing will be conducted in the following manner: First, Mr. Hoff of the Mid-Atlantic Council staff will present a summary of the Plan. Then you will be invited to comment on any aspect of the Plan. All comments will be recorded by staff and will become part of the permanent record. Your comments will be supplied both to the Councils and to the National Marine Fisheries Service for their consideration. We ask that you limit your comments to the provisions of the Plan, Environmental Assessment, Regulatory Impact Review, and proposed regulations. We are here to record your comments and to answer questions relating to these documents and not to debate other issues. Each person will be given an opportunity to speak for the record. Please try to keep your comments brief and to the point.

Tom Hoff will now present the draft Amendment (Attachment 1).

Lee Anderson: We will now open the Hearings to comments. In making your statements, please speak loud and clear so that we may record your comments for the record. We have small mikes up here and we would appreciate it very much if, when you give your comments you will come forward so that we can hear you. If in the process of your speech you hear a little click, that means we have run out of tape. Please wait until we turn the tape over. We don't want to miss anything. I know that could ruin your chain of thought. We will give you a chance to start over again. If you would cooperate with that, I would appreciate it. Bob?

Robert Smith: Those who are attending might like to know that there are extra copies of the Hearing Document up front. You might want to look at it, that's what they are here for.

Lee Anderson: Yes, there are packets right here.

Rich Ruis: Also, a lot of people came in after you gave your initial introduction of how you are going to proceed, here. Maybe you would like to explain once again how you would like to proceed.

Lee Anderson: O.K. We are interested in learning why you favor or oppose a particular measure. Remember the Plan must meet the Standards of the Magnuson Act, which means that we must explain the reasons for and impacts of each measure. Please state your name for the record and then the name of the organization for which you may be acting as an official spokesman. We have a sign-up sheet that went around. What I will do is go down the sign-up sheet in order and if anybody has not signed up, I will give you an opportunity to speak afterward. Rich, did you have anything else that you wanted me to review, or did that review cover what you were speaking of?

Rick Ruis: What about questions, just simple questions. If people don't have statements to make, would they be able to just ask their questions?

Lee Anderson: If you have a question of fact, yes we would be happy to answer any question of fact. The issue is, we are not here to debate things, but if you have a question of what something means, we would be more than happy to answer those questions. O.K.? O.K., we will proceed with the list. And I have not had the opportunity to meet some of you and I see that some people signed their name like I do where the last letters sometimes become not legible. So if I mispronounce your name I ask your indulgence ahead of time. Mr. Garvilla. Remember to please state your name for the tape and the organization you represent.

Joe Garvilla:

My name is Joe Garvilla, I represent the United Shellfishermen's Association. The United Shellfishermen's Association has voted to oppose the adoption of Amendment 8. U.S.A. has a membership representing more then 70 vessels, many fishermen, and several companies. In our last meeting the majority of membership voted to oppose Amendment 8 in its entirity.

Some of the more objectionable portions of Amendment 8 are: the massive consolidation of quahog allocations immediately and the unlimited consolidation of surf clam allocations in three years. The proposed allocation concept in Amendment 8 gives the resource to vessels without regard to fishermen and this is unfair because it penalizes fishermen who have worked for many years, but have recently just purchased new vessels with little history. It unfairly penalizes fishermen who have had no market for their product for an undetermined period of time. It penalizes fishermen who have made investments in reliance on the system now in place and enforced by the Council. Regardless of the allocation formula used, proposed Amendment 8 gives the opportunity to foreign nations to control the resource.

Two foreign nations are now active participants in the industry, and both of those corporations have great financial power. Although the regulations may propose to prevent a foreign nation from owning an alloca-

tion permit, it is not hard to imagine how many methods by which a foreign nation could control most of the domestic resource.

There are two additional points regarding quahogs that make the Amendment 8 unacceptable to U.S.A. Number one, there is no rationale for a quahog allocation or moratorium. And number two, there is no reason to prevent shucking at sea. We hope that the Council would listen to our concerns and recognize that it serves no one's interest to adopt a system so objectionable to industry. Thank you.

Lee Anderson: Thank you. If any of you would like to submit a written copy of your remarks that would be suitable. In fact, it would help our secretaries in transcribing. So please do that if you have something in writing you would like to submit. Mr. Richardson.

George Richardson: My name is George Richardson representing the Blount Seafood Corporation and the fishing vessel Wando River. We strongly oppose Amendment 8 in its entirety. We don't believe that the strong historical bent the Council has chosen would accurately allocate the resource to present participants in the fishery. We don't believe that Amendment 8 fairly deals with anybody in New England, whether they have a Mid-Atlantic permit or not. We don't believe that the allocation system could be managed in a way that would be fair to any fishermen at all. So we strongly recommend that it not go any further than this. Thank you.

Lee Anderson: Thank you. Mr. Rosinha.

Albert Rosinha: My name is Albert Rosinha, F/V Rebecca Ann Naomi. I, as a New England fishermen, strongly oppose Amendment 8. Most of the reasons have been put before you by the other two gentlemen. Basically, I can't see how I as a small businessman can make a living with Amendment 8 if it is put through. Thank you.

Lee Anderson: Thank you. Mr. Brayton.

Charles Brayton: I'm Charlie Brayton. I own F/V Heidi and Kristi. And I oppose Amendment 8. I don't believe I would make out very well because of my time that I've fished. I just don't approve of it all the way around for anybody.

Lee Anderson: Mr. Lagace.

Louis Lagace:

My name is Lou Lagace. I own F/V Ellie B. The vessel has been sea clamming in New England since 1978. I have been reporting clams since approximately 1982, 1983. I operated the vessel since 1981. I purchased it in 1987. Under Amendment 8, it would be very, very marginal, for me to continue operating the vessel without great expense. It could not be rigged for any other fishery besides surf clam or ocean quahogger unless major structural changes were made to the boat. And I say this, because under these different allocation systems, because we had a history of reporting the boat operated with two captains for a number of years, and we probably have one of the better allocations, and that allocation isn't sufficient to operate. And I say that because I think we probably have one of the better ones. If it comes to question as to how come we survived all these years and our reports are based on this allocation suppose to be there, how come we can't continue reporting since 82. Well we have done a certain amount of fishing in state waters in Massachusetts. That has taken a quite a bit of share of our total production. You know three miles from the coast line doesn't include too much fishing area, and I don't need to say that it is getting depleted. And the clams are found on the Nantucket Shoals or off the Georges Banks and because of the fact that the log book reports don't favorably show how many bushels have been caught over the years, so consequently we have a small allocation.

Consequently, I oppose Amendment 8 as being unfair not only to myself but to the entire, as a group, the entire, New England fleet. And, I think its against one of the main objectives of the Plan which is is not to be discriminatory to residents of any particular state. And it is very discrimiatory to the New England fleet. Thank you.

Lee Anderson: Thank you. John Babbitt, F/V Ellie B.

John Babbitt: My name is John Babbitt. I represent the Ellie B. I'm not a boat owner. I am a captain. Under this Amendment as far as I see, I don't have anywhere to go. I like to run boats. I don't have any allocation and I have no future in the industry, except for running vessels, unless I want to come up with a dollar figure and purchase it in the future. And to me its just like a slap in the face. Like you have to start earning your living. You are going to have to buy it in the future. So I am just against it. It doesn't make sense to me. I don't like it.

Lee Anderson: Mr. Morse.

Bradford Morse:

Good evening gentlemen. I am Bradford Morse. I am captain of the F/V Hizzoner. I vehemently oppose Amendment 8 on the grounds that us, as a vessel, haven't been working since 1984--what with the weather, market limitations, and a bunch of other games. Now, we're a small fleet up here. It's just a small boat. We don't even use cages. We use bags. As far as the allocations go, I know that our allocation would most likely be small.

I am in favor of the alternative option, where its put back to right where it is. Because as it comes out, you usually don't get, I mean you're not totally able to rape the bed, excuse the expression, because you could only get so much on the boat. You can only catch so much. We have limitations already built into our operation.

We sometimes like to shuck bait at sea for cod fishing. And one of the provisions in the Hearing Document is that we couldn't shuck bait.

Basically what I see is that we are limited enough in what we can do as it is as it stands. And Amendment 8 would change that to where we would be cut in half. And to be honest with you we're just breaking even as it is. That's all I have to say. Thank you.

Lee Anderson: Thank you. Mr. Brayton.

David Brayton: My name is David Brayton, F/V Patriot. I would just like to go on record as being opposed to this Amendment. I find it to be totally unfair to the New England fishery. And I'd just like to go on record.

Lee Anderson: Mr. Fryer.

Scott Friar:

My name is Scott Friar, and I am with the F/V Mark and Bruce. I would like to go on record as being totally opposed to Amendment 8. There are a multitude of reasons.

I represent one of the smaller operations in New England and we are multi-fishery boats that like to switch back and forth, especially with the market. And this would make it very difficult to do.

I also would like to mention I am very happy at this time with Amendment 7. I think it works well for the bulk of the fishermen here, myself included.

I'd also like to say I think that I am beginning to think that the Council system is getting very antiquated and Standard 3, the management throughout its range standard, should be looked at very closely. I think that the New England fishery is quite a bit different from the Mid-Atlantic fishery. It's the same species we are talking about. But, from talking with the people in the Mid-Atlantic area, we go about things completely different up here. I think this would probably be a good test case to the National Marine Fisheries people to take and possibly give us our own area here. The range of the surf clam does go up to New England, but we should have our own area. Thank you very much.

Lee Anderson: Dave Borden signed, but he didn't say yes or no. Do you want to speak?

Dave Borden: I will pass at this time.

Lee Anderson: O.K. Gene Janowski.

Gene Janowski: Gene Janowski, representing Borden, Inc., read a statement that Borden believes it would be severely disadvantaged under any allocation formula which is based on historical fishing practices and that the ban on shucking at sea would arbitrarily prevent companies like Borden from choosing this option in the future. (Atttachment 5)

Lee Anderson: Thank you. Bob Smith.

Robert Smith (Attachment 7):

My name is Robert Smith. I am a member of the New England Fishery Management Council and Chairman of the New England Surf Clam Committee.

On many occasions the New England Council has formally commented on Amendment 8 on several occasions during the past two years. On each of these occasions the Council has expressed concern that Amendment 8

include the alternatives designed to leave the New England management area in ocean quahogs out of the proposed individual of vessel allocation programs.

On May 12th, 1988, the Council formally registered its opposition to the inclusion of the New England surf clam and ocean quahog fishery under the proposed vessel allocation system. And we have not received any comments relative to that letter that we sent. I'll give you a copy of that letter. We would like an answer to that letter if we could possibly get it. It was sent May 12th, 1988.

The New England Surf Clam Committee again met with advisors on February 24, 1989, to review the individual vessel allocations proposed and other alternatives identified within the 12.28.88 hearing draft of Amendment 8. The attendance list from this meeting is attached to these comments and identifies ten individuals engaged in some aspect of the New England Surf Clam fishery. The industry representatives at this meeting continue to be unanimously opposed to any individual vessel allocation regime that utilizes any of the formulas currently developed for either surf clams or ocean quahogs. The strong sentiment expressed at this meeting is to avoid the imposition of any allocation system in New England and remain under the regulatory regime provided by Amendment 7.

On March 2, 1989, the New England Council voted unanimously to reaffirm its earlier position that the existing New England and Surf Clam and Ocean Quahog management regime under Amendment 7 be continued without any of the changes proposed in Amendment 8. The specific motion before the Council was as follows:

That the New England Council recommend to the Mid-Atlantic Council, that the New England area, i.e. Georges Bank and Nantucket Shoals, be excluded from the vessel allocation system developed in Amendment 8. It is also the recommendation of the New England Council that the ocean quahogs not be included in the allocation system.

Thank you

I've got some other comments I would like to say. If you read through this draft, it's not very clear, in my opinion and other people's opinion in New England, that it really is not a limited entry scheme. It says that it is not and that you will be able to fish seven days a week. If you fished in New England and come under this regime I am going to say right now, that it is not an unlimited a free and open fishery. If you have never fished before, the only way your going to get it is buy it from someone else if possible--if there is some for sale. I don't know anyone at this point that is too interested in buying too many clams for much more than a dollar or so a bushel. From what I understand, they are anywhere from $5 to $7 a bushel. When you were forming this Plan, the prices were quite a lot higher, and maybe there would been someone who was interested in buying a few. But it's all hypothetical as I can see it at this point with the price of clams and the inventory that is around.

As far as ocean quahogs go, we don't see any reason in the world for going to this type of a system when the ocean is literally full of ocean quahogs. And the marketplace just could never ever create a problem with the stock at this point, as we see it--fully understanding that you will only be allowed to harvest up to six million bushel a year with a standing stock of probably in excess of 2.2 billion bushels.

The other thing that we're very concerned about is that the staff or the scientific community has said that, that under Amendment 8, the clams on Nantucket Shoals and Georges Bank, will not actually have to be harvested there even though those quotas were set up and identified as stocks of clams in those two areas. That not necessarily will they have to be harvested there, but yet the total will be put on the overall quota, and we're disappointed about that.

Would you like our comments on the alternatives for the proposed Amendment? I have some of those if you would like me to go over them.

Lee Anderson: We would like every comment you have, Bob.

Bob Smith: O.K. Then under 2.1.2.2, surf clams on Nantucket Shoals Area, these are the ones that we would prefer you go with: 2.1.2.3, Surf Clams on Georges Bank area; 2.1.2.4, Ocean Quahogs; 2.3, the bottom of that statement that says, "management of ocean quahogs and New England surf clams would remain unchanged"; 2.3.2.2, Surf Clams, Nantucket Shoals Area; 2.3.2.3, Surf Clams, Georges Bank Area; 2.3.2.4, Ocean Quahogs; 2.5, the bottom part of that statement, the last sentence that says, "management of ocean quahogs and New England surf clams would remain unchanged"; 2.5.3.2, Surf Clams on Nantucket Shoals;

2.5.3.3, Surf Clams on Georges Bank Area; 2.5.3.4, Ocean Quahogs; 2.6.2.2, Surf Clams, Nantucket Shoals Area; and 2.6.2.3, Surf Clams, Georges Bank Area; and 2.6.2.4 Ocean Quahogs. And that's it.

Lee Anderson: Now, that's on the record, Bob. But if you would write that down on sheet of paper and send it in, that would make sure we don't have any mix-up. I would appreciate it very much.

Robert Smith: Here is the statement I just made. And the letter on the bottom that we never didn't ever get a comment on, we'd like one.

Lee Anderson: Mr. Schneider.

Jeffrey Schneider (Attachment 8):

My name is Jeff Schneider. I'm from the Washington law firm of Hogan and Hartson, and I'm here representing the Independent Shellfishing Association. I was also given a letter written by a Mr. William Brunell, and also one by his wife, in total opposition to Amendment 8 for some of the reasons I will go into in a minute. I just like those to be included in the record.

The I.S.A. consists of the following individuals: Max Cohen, R. D. Dempsey, Don DeMusz, Bill Gifford, Harry Higbee, Thomas Keenan, Frank Mariner, Charles McCullough, James Pearson, Dick Shaw, Barney Truex, Martin Truex, Wilbur Wiseman, Borden, Inc., Gorton's Canned Seafood, Mid-Atlantic Foods, Inc., Sea Watch International, and since the last meeting on Monday, Bill Riggin's Port Norris Clam Company, Bill Shoffler, Pete Pearson, and Bill Brunell. As I have said before, we seem to be growing all the time.

The I.S.A. was formed, as I have said before, totally to respond to Amendment number 8. We exist solely for the purpose. And I apologize if I am less brief than I should be, but this is the last opportunity, the final public hearing, the last opportunity to speak on record. At least until the next opportunity,

You've now heard from a huge portion of the industry. I.S.A., our group, and United Shellfishermen's Association conservatively represent 80 percent of the active industry participants. You've heard their viewpoints both individually and through their spokespersons. You've also heard from a large number of individuals who are not members of either I.S.A. or U.S.A. and tonight you've heard from a large number of New England fishermen and you'll hear from more. And with two exceptions, every single speaker at every public hearing has totally opposed Amendment number 8. Even the two speakers that expressed some limited support for the Plan opposed the shucking probation and opposed the quahog allocation.

Now it has been said, and you said it tonight in your summary of the Plan, the management measures are not a popularity contest (tape not clear). That's true, but this is getting ridiculous. When a measure receives such overwhelming opposition, the Council must ask itself if there isn't, in fact, some serious problems with the Plan. In this case there is, and I'm getting to those in a minute. Moreover, when an amendment such as this is promulgated largely to respond to industry concerns, which is overcapitalization and not to the problems of the fishery, such as conservation problems, and you've admitted time and time again, there are not serious conservation problems in either fishery right now, the voice of industry should carry a great deal of weight. But if Amendment 8 goes forward at this point the Council will demonstrate its desire to run roughshod over industry and industry's legitimate concerns.

Now very briefly, because I've discussed these in the past, I want to recap some of the arguments that come to mind, practical, legal, and equitable, that have been made against Amendment number 8.

(a) Procedural inadequacy:

The Council has failed to provide a single Amendment 8 for complete and thorough public review and comment. Instead, you provide us with nine formulas, which you've thrown out. The Council apparently couldn't agree on a single formula. The Council's afraid that any one formula would receive such total opposition, they thought if they'd threw out nine, they would maybe they would get some fragmented support. It's inappropriate and the public doesn't have an opportunity to thoroughly analyze and comment on each individual formula. If I tried to do that, we'd be here until 3:00 and no one else would get a chance to speak. And even the Chairman of the Council stated that it's probably improper for nine formulas to have been thrown out. If the Council can't even decide on one formula, how do they expect to come up with anything reasonable and push it through and get NOAA approval and public support is beyond my understanding.

(b) Failure to promote conservation:

First, it's been said tonight, you've said it yourself, throughout the Draft, there is just no current shortage in either the surf clam or the ocean quahog fishery. Amendment number 8 will have no pro conservation effect

since it doesn't affect the overall catch. The only conservation effect it has is a negative one since it allows the size limit to be suspended from year to year.

(c) The cage tolerances proposed in this Plan are unreasonable:

They are going to go from 240 undersized clams per cage to 50. A a number of fishermen have expressed their views that it would be an impossible tolerance to meet.

(d) Failure to promote efficiency:

The Plan kills incentives to improve fishing methods or modernize vessels by eliminating competition and telling fishermen nothing they do except spending money to purchase allocations, will increase the size of their catch. Under the present system if you build a better mousetrap, you catch more mice.

(e) Failure to minimize administrative costs:

Especially in the quahog fishery Amendment 8 greatly increases costs by establishing an entire regulatory and enforcement scheme where none currently exists.

(f) No scientific data supporting the need for an allocation:

Again, the Council and Council staff has failed to provide any scientific data that suggests there is conservation rationale.

(g) Quahog allocation without reducing the quota first:

You have now reduced the quota and without examining the positive effects it has without instituting a moratorium would be action inconsistent with prior Council action, which by definition is arbitrary and capricious and subject to judicial law overthrow.

(h) The amendment lumps surf clams and quahogs into a similar management scheme thus failing to take into account variations in the fishery as required by the National Standards:

In this case, the surf clam and quahog fisheries have completely different conservation concerns. There are completely different historical backgrounds to these two fisheries. And there is a completely different dependence on the fisheries by fishermen. They also have completely different market values. So lumping them together makes no sense and probably does not comply with the National Standards.

(i) The recommended formulas are not fair and equitable as required by National Standard 4:

We've discussed this in the past. The formulas focus on vessels, not fishermen. And they could drive out of business individuals with twenty years of history of involvement in the fishery.

(j) The recommended formulas are arbitrary and capricious, especially the average of years fished formula put forward for the quahog fishery:

In that case, and we have talked about these examples and I've put them in my written comment, in an extreme example, a fisherman who fished one extra day than his cohort, caught one extra quahog, ends up with half the allocation, depending on what extra day he fished.

(k) The allocations are also unfair and inequitable because they would be based on history and would therefore reward past violators of the time-based regulations:

It is the tacit assumption that everyone has been a violator and everyone been violating equally, and therefore those effects move out. That's a ridiculous assumption. It's not the case that everyone's violated the regulations. Certainly, not the case where all violaters have done it with equal amount of impunity.

(l) The allocations are illegal because they allocate the actual resource and not the opportunity to participate in the resource, and the Magnuson Act does not authorize allocations of the actual resource.

(m) The proposed Amendment violates National Standard 4 because it will result in massive consolidation of the industry and therefore excessive shares of the resource will fall into a few hands.

Massive consolidation will drive many long-standing fishermen out of business and will result in monopoly prices which will have a negative effect on consumers.

(n) The anti-trust laws can not be relied upon to prevent this:

Even if they applied to this industry, which is not clear, they may not be enforced by the government. And even if enforced, it is not clear that they could stop consolidation, beyond that authorized by the Magnuson Act.

(o) The proposed quahog allocation violates the National Standards further because its clearly designed solely to achieve economic goals:

There are no conservation, safety, or enforcement problems in this fishery because it's outside the regulatory scheme. So, the only justification must economic and the Standard doesn't allow for allocations solely to achieve economic purposes.

(p) There is no rationale for the anti-shucking prohibition:

It was throw into the Plan without any industry comment or discussion. It would cost fishermen hundreds of thousands of dollars in lost investments without good cause. And the goal of this provision, apparently ease of enforcement, can be easily achieved through a shucked to unshucked weight conversion factor, as was admitted by the Council staff at the Philadelphia meeting in July.

(q) The shucking-at-sea prohibition is anti-environmental and runs directly counter to the trend in environmental legislation which is toward prohibiting onshore shucking.

(r) The shucking-at-sea prohibition runs counter to the Magnuson Act regulations which prohibit restrictions on cost-effective and productive processing techniques absent of conservation or social objectives.

(s) The proposed Amendment will result in more safety problems in the fishery:

There have been some concerns about the safety problems under Amendment 7 because it encourages fishing on bad weather days. This can be addressed by simply loosening the restrictions on bad weather fishing and on makeup days. As a matter of fact, I've been informed by some of my clients, its been three years since a vessel has been lost at sea due to bad weather. In fact, this Amendment would discourage fishermen from replacing and modernizing vessels and it would encourage fishermen continuing to fish in dilapitated, unsafe hulls. Again, there is no incentive to modernize. So my contention is this Amendment, far from promoting safety actually causes more safety problems then it solves.

(t) Dilution of the quota:

The recommended history-based formulas would grant a percentage of the resource to vessels that have been inactive for many years, thus diluting the amount of the resources that will be available to active fishermen.

(u) The proposed cage tag system is burdensome on vessel operators and the logistics of the system may slow fishing operations and may require extra crew for compliance, thus adding to the overall cost of putting the Amendment in place.

(v) lack of phase-in period:

This dramatic shift in management scheme is not tempered by any phase-in period. Individuals who invested millions of dollars in new quahog vessels, for example, might lose their entire investment just as their ready to drop their vessels into the water.

(w) The formulas are not current:

They don't take into account 1988, or 1989, data. They don't account for present participation in the fishery, as is required under the Magnuson Act.

(x) Unlimited transferability rewards wealth, not in initiative, and will allow any large company, such as IBM, with large cash surpluses and no history of involvement in the fishery what so ever, to purchase as much of the resource as they care to.

(y) Unlimited transferability would allow foreign-controlled companies access to the entire resource:

A foreign company with enough capital could theoretically purchase the entire quota and this is not outside the realm of possibilities, given the current foreign inroads into the fishery.

(z) Any attempt to restrict foreign purchases is bound to fail:

This is a legal matter. The Magnuson Act provides some protection to foreign nationals. In addition, *alienage is a quasi-suspect classification under the Equal Protection Clause under the Fourteenth Amendment.

Consult your lawyers. So, any restrictions against foreign purchases may have Constitutional problems. And as a practical matter, an American can always front for a foreign individual or company and purchase the entire allocation.

As you can see, there are problems from A to Z, and these are just some of the problems. I've listed about 25 but I'm absolutely positive that I have omitted many. For example, I've not even touched upon the special concerns this Amendment would cause the New England fishermen who would be suddenly merged into the regulatory scheme. The New England fishermen are not my clients, and I am not as familiar with their concerns, but I assure you they have additional problems with the proposal, as you've heard tonight.

I can only at this time encourage everybody in this room, to flood NOAA and the Council, and especially your Congressmen, with letters and phone calls stating your opposition to the Plan. Clearly the Council has not been listening to what industry has been saying up to this point or we would never have gotten this far. And, this is your livelihood, and if you trust in them to listen to your overwhelming voice right now, you're rolling the dice. I would like to believe that they're operating in good faith, and I think they are, but where your livelihood is concerned you should bring pressure to bear on your elected officials, as much pressure to bear as you possibly can. If you listen carefully, you'll note that the Council, in summary has already passed judgement on the Plan. Already stated, which formulas comply with the National Standards, even though they are not attorneys and the Plan has not been put into place or tested yet. And, they've already stated which formulas they do not think comply with the National Standards, definitively stated. Moreover, they state in their summary that they don't care how unpopular the Plan is. So that should give everybody here a clue to what they should do now.

At any event, the I.S.A. has tried to convey through oral and written comments over the course of these hearings, that there are so many serious, practical, legal and equitability problems with Amendment 8 that it is unworkable. These problems alone should be enough to kill the Amendment at this stage, but these problems are coupled with industries overwhelming opposition should make the Council's next steps very clear. At this point the Council can move in either of two directions, it could choose to go forward with Amendment 8, thumbing its nose at industry as well as at reason. And if it does, this industry and the Council will continue to be at each other's throats. My clients will pursue every administrative route available to block the Amendment. If nothing else succeeds, they'll be in court the day after the Amendment goes into effect asking for an injunction. Everyone will spend an enormous amount of time, energy and money, and we may still be at square one two years from now. Or the Council can take a hard look at the Amendment, its objectives, its problems and the overwhelming industry opposition, and agree to start over working with industry to cooperatively devise a plan that would address legitimate concerns of industry and of the Council, while maintaining fairness and equity, and also, legally complying with the Magnuson Act standards and achieving broad-based industry support. And that is what we are asking the Council to do. Thank you, I would just like to request that when a written transcript of all the comments made at the public hearing is typed up, that I receive a copy. Thank you.

Lee Anderson: Do you want to leave a copy of that?

Jeffrey Schneider: They are just notes.

Lee Anderson: Lucy Sloan.

Lucy Sloan:

My name is Lucy Sloan, Pt. Judith Fishermen's Cooperative Association. Obviously we support the position of the New England Council on this. Looking at it from the Co-op's perspective, although at one point there were many vessels in the port many years ago involved in ocean quahogs. We aren't at the moment. However, the Co-op has survived for forty years based on the premise that the maximum flexibility to move among fisheries was the best available alternative, not only for the fishermen but for the resource, because that flexibility meant that they could move with greater freedom off resources that were in difficulty and in which the catch per-unit-effort had declined and onto resources where there was greater opportunity for harvesting at a lower cost per- unit-effort for the product. At this point, therefore, with the stock not in trouble, we have to look at what possible justification there could be for combining New England with the Mid-Atlantic and for ignoring some of the arguable interpretations of the National Standards.

As you all know I am not an attorney. However, I was around and actively involved in writing the National Standards, and for every assertion that there is in Amendment number 8, about what the National Standards say, I can make and an equally valid one and go back to the legislative history. And I would like to run briefly

through some of those points because I think that shows that the Mid-Atlantic Council, apart from the concerns which my colleague from I.S.A. raised.

I think that that shows that there are a number of possibilities at which to look if you look at the third National Standard, you look at "shall be managed as a unit", but what it says to begin with is, "to the extent practicable". And I would argue that its not really practical to combine something as diverse as the Mid-Atlantic fishery with the New England fishery. And that is something that we could get into and go back forth on, but I'm just saying that there are alternatives to virtually all of your interpretations of the National Standards.

Under National Standard 4 (c), I think that, as others have pointed out, it's entirely likely that this Plan would be carried out in such a way that individuals, corporations or other entities would acquire, in fact, an excessive share of the fishing privileges. The reason for that is that it looks great if you're already in the fishery and have a history of participation. It does not look so good if you wanted to move into that fishery because all of the traditional and only recently under utilized species are now fully utilized. This would be one alternative denied, which continues to put pressure on other fisheries if the option is completely removed.

Under Standard Number 5, you have a situation where you are promoting efficiency in the utilization of fishery resources except that no such measure shall have economic allocation as its sole purpose. Given that the resource isn't in trouble I'd suggest that its hard to see what the purpose is other than economic allocation. So I think you should look at those and the context in which the Plan has been put together.

Its the first time, in my involvement in the councils which began the 11th of August 1976, I've ever heard a Council talk about (not needing or running a popularity contest [tape ran out, not recorded])*. I think they are protesting a bit much. I think that popularity is one thing, responsibility is another. And I question, given that I understand that there has been opposition at virtually every hearing to this, whether it wouldn't be better to rethink it. Because there are those of us who are not at the moment immediately and directly involved in this fishery who see it as the beginning of something that is, we think, unnecessary and expensive. The Council admits that its efforts in previous amendments have not reduced effort. And after seventeen years of working with commercial fishermen, I can tell you there is no regulation that anyone is going to come up with that a good fishermen can't find a way around in 48 hours. And so if there is the overwhelming lack of support for this Plan that there appears to be, I gather that what you heard tonight at this hearing is not unusual that there are a number of other objections that you've heard at other hearings, if you haven't the industry agreement that this is a Plan that is enforceable and worth enforcing, than I suspect that it is not going to prove anything. And you'll wind up with what you have in Alaska, with the 58' limit seiner/aircraft carrier. The problem of any regulation you make, fishermen will find ways around.

It isn't as I look at the Plan, defensible under the National Standards. There have been arguments made, but I was also beguiled by the fact that in the discussion of the National Standards, there were perhaps more rhetorical questions than there even were assertions as to the legitimacy of the justification that was implicitly, by virtue of these questions rather than being offered. I would have preferred things that said, "The Mid-Atlantic Council thinks for the following reasons that this is why. Instead there were a number of questions". Is this fair? Is this reasonable? My answer to what I presume were rhetorical questions is, no it's not.

I think the Council would be well advised at this point to go back and reconsider seriously, on the basis of the comments, whether one wishes to proceed with this pig in a poke. Nine formulas is indeed a peculiar thing to offer. It is disingenuous to indicate that it says, "We are offering you this wide range of choices". As Jake Dykstra always said, "Don't get suckered into discussing the color of the paint on the bathroom walls when you said you don't want to buy the house". Those nine formulas are the color of the paint on the bathroom walls And for any businessman, which fishermen are, to say, "Yeah, we'll take this approach and you guys can work out the formula by which I can go fishing", would be absolutely insane from a rationale business man's point of view. If I were a bank, I would look very much askance at somebody who said, "Oh, I want to do this and that with a vessel that's going into this fishery. No I don't know exactly the parameters which will define how I'm able to fish but you know I'd like to borrow some money to work on my vessel". I think these are things that need looking at.

From putting on my Washington hat, I think that at this time for this Council with its other important Plan responsibilities to look at doing something that is clearly this unpopular with enough people in the industry in which it would affect. At a time when the Council budget line item and the Administration budget has been cut to $3.4 million, it is not a responsible thing to do for a system that all of us who are involved in it have hoped would provide fishermen with an opportunity so that they wouldn't have to hire an attorney to get involved in a roll of the dice with odds no better then 50/50, on how their businesses would be run. So I would

strongly urge that you go back and look at why you have received the negative comments that you have and reevaluate what you got.

And by the by, get somebody involved in the New England process on the surf clams. I would be interested to see an answer to the letter, of May 12th, 1988. Thank you, gentlemen.

Lee Anderson: Hans Marcher.

Hans Marcher: I'm Hans Marcher of the F/V Marie Kim. I wasn't going to go into details, but the last speaker, Mr. Schneider, and many others, have already voiced objections to Amendment 8, and that was the main thing we were going to do here, too. We will send you a letter with the details of these objections.

Lee Anderson: Thank you. Dave Wallace.

Dave Wallace:

My name is Dave Wallace. I represent Shellfish Vessels and Shellfish Packing. Shellfish Vessels owns and operates 19 Mid-Atlantic surf clam vessels. We wish to go on record as strongly opposing Amendment 8 as written. And suggesting that it was dead on arrival when sent out of the Council, because it comes up with nine formulas as a preferred alternative, which makes it very complicated, and has so many flaws because of its complicated nature. So there is no rational way of being able to determine what the Plan would actually be.

The other thing that has bothered my client for a long time, is that in the past, Amendments came out which were consensus of industry. When the Council's staff decided that they didn't like what they heard from industry, they decided to ignore them, telling the Chairman of the Advisory Subpanel that his meeting was not sanctioned by the Council, when the Chairmen on the Surf Clam Committee had told the same committee to meet any time they felt like. Because industry was paying its own way, with no funds of the Council what so ever to support the operation of the Advisory Subpanel. And yet when they were told what the consensus was, they decided to ignore it. They didn't disband it, they just made sure that it was ignored.

What the Advisory Subpanel said is, "Stop, you have the cart in front of the horse. You're trying to build a pyramid without putting a foundation under it". The problem is that you have too many vessels chasing too few dollars. You can't support the vessels you have and now, if you put an allocation system in effect, it clarifies the dollars to each vessel. They don't think about it in bushels, they think about it in dollars. They know what the current rate is. Your own statistics show the fleet losing money. And you used the wrong number. You used the right number of bushels but the wrong dollar value, when you made the presentation in Philadelphia. The fleet is losing a fortune. Every person to whom you say, "We're going to allocate this many bushels to you", he says, "Times $5 or times $8, whatever the number is, I'd go broke." That's a perfect reason not to do it. "No, I don't want to do that. I don't want to go broke". Every independent businessman in the world wants to stay in business if he can. He at least doesn't want to be regulated out of business. If you are going to let him go out of business, let him go voluntarily.

As I said in the past, industry has come up with a consensus. This consensus was, that first of all we eliminate New England from the discussion of Amendment 8 as far as a allocation system. Number two, that a moratorium be placed on fishing quahog vessels and not an allocation system. Therefore instead of having 900 permitted ocean quahog vessels, after the first year you wipe out all but a 20 of them, so now you have a manageable number. But this attitude says we're going to ignore everybody's right to fish without notice. What I had suggested, and what the consensus of industry suggested is that you put everybody on notice.

The industry has said we need to have limited consolidation on surf clams in the Mid-Atlantic so as to reduce the number of vessels to a manageable number. I think that that is a building block that you have to build the pyramid on. I have said that a thousand times. Nobody wants to listen.

The other thing is that, I think, it made it very difficult to justify this in the big terms, not the little terms, is how can you have one formula for surf clams and another formula for ocean quahogs and then say that they are fair and equitable? You can't. That's a conflict in terms. The Document contradicts itself. It's in conflict with itself. I'm not a lawyer and we got plenty of high-powered expensive lawyers back there and I'll let them argue, the logistics of that. It's just that the logic defies me, as an individual.

Therefore, we strongly urge, my clients strongly urge, that we scrap this and don't spend a lot more time. Put the Advisory Subpanel back in place, they ask no money from the Council. Let us bring to the Council some reasonable rational recommendations on what an amendment should look like. It would not look like what is being published.

Lets go forward where the Council and the industry work in unison and not at loggerheads. Thank you.

Lee Anderson: Dave, did you want to take an opportunity to speak?

David Borden:

Yes. My name is David Borden. I'm here representing both the Council and Rhode Island Division of Fish and Wildlife. I should qualify that by saying that Bob Smith's comments represent the formal Council petition. So, my comments will be coming from the Division of Fisheries.

First off, I would like to thank the Mid-Atlantic Council for coming up to New England and conducting a meeting. Normally the meetings in New England are considered the combat zone, but I understand it's been a series of combat zones.

I'd just like to say that from my perspective I have viewed most of the provisions of the Mid-Atlantic surf clam quahog Plan as being grossly discriminatory over time. And I think that this is a continuation of the discriminatory practices of old. I would just state for the record that I agree with most of the statements that gentlemen from the Independent Shellfishing Association stated before--his twenty-five points--but I would like to emphasize one point.

In terms of ocean quahogs, 60 percent of the resource is located in the New England area, and yet only a small fraction of those quahogs are, indeed, harvested by New England vessels. This Plan would essentially preclude the development of any form of New England ocean quahog fisheries to any significant degree. Given the current status of the resource with this 33 year supply at the current extraction rate and given the assumption that there would be no recruitment of the fishery. I think that Lucy Sloan made an excellent point that, in fact, the only basis for this proposal is economic allocation and economic allocation for itself. So I would say that for a number of reasons the proposals are in violation of the National Standards.

I will just close. I'm not going to reiterate a lot of the statements made by the other speakers have made. But I will close with an editorial comment, that I would hope that the Mid-Atlantic Council would go back and rethink the entire basis for the Plan and in fact attempt in its next variation of the Plan, to come forward with some clearly identified alternatives that the public can understand. I think that, to a certain degree, it does a disservice to the public hearing process to take this many alternatives out to public hearing. They're sufficiently complex and convoluted, so I would be willing to wager there aren't five people in this room that fully understand all of the alternatives and all of the implications of the alternatives. So I would just pass that on, thank you.

Lee Anderson: Tom, would you like to say something?

Tom Alspach:

For the record, my name is Tom Alspach. I represent Sea Watch International. I've spoken at two meetings before and I won't take the time to reiterate those remarks. They will be in our written comments. And Mr. Schneider's comments fairly well summarized what our position is on the important issues.

What I would like to do briefly this evening, is talk for a moment as the individual who had the dubious distinction of serving as the Chairman as the erstwhile Industry Advisory Panel, which existed or did not exist for given period of time. It's unclear whether it exists at the present time, for that matter. But I think its important that the record reflect what the experience of the Advisory Panel was in connection with development of this Plan, because there is a very specific regulation which has been inactive pursuant to the administrative provisions of the Magnuson Act, which states to the effect that the Council should take the views of an Advisory Panel into account in developing and formulating a Plan.

A very tentative initial effort was made to do this approximately two and a half years ago when the Industry Advisory Panel was appointed. At our first meeting in Norfolk, VA, the Panel was comprised of eleven individuals, representing processors and fishermen. And it had geographic representation. In fact, we were honored to have the presence of George Richardson from New England on our Advisory Panel and he participated in our meetings.

We made our first recommendation to the Council on the subject of consolidations and allocations at a meeting in Atlantic City approximately two years ago last month. For that matter, exactly two years ago last month. The recommendation we made had been the result of a meeting we conducted ourselves in Baltimore, at which, as someone mentioned earlier this evening, all of us attended at our own expense. We spent an entire day trying to flush out how we could move towards some sort of reduction of effort in the fleet, to work toward the problem of overcapitalization. What we reported out of Atlantic City was our view that

was, I believe, a unanimous view, with one partial dissent, that a consolidation at the outset should be comprised of no more then so-called one-per-one, consolidation, putting a second licence on a vessel, allowing one vessel to take two trips within the current time base system. A very specific, recommendation was made and it was a recommendation that the rest of the industry has echoed, that there be no so-called massive consolidation whereby one individual who happened to have perhaps ten vessels could take all ten of his trips on one of those vessels because of the obvious economic advantage that would give him to the detriment of all those individuals who have one or two vessels and couldn't enjoy those economies of scale.

The Industry Panel reported that decision to the Council in Atlantic City, and we weren't really heard from again because we weren't asked to do anything more for about nine months. In fact, the next major event in the history of the Industry Advisory Panel was an effort to disband it, which was announced by the Chairman of the Council, Mr. Martin, at a meeting in the Fall of 1987. And that effort to disband the Panel had been prompted by one individual, who is no longer participating in these hearings, who represented a corporation that felt the Industry Advisory Panel was slanted too much toward the views of the fishermen members of the United Shellfishermen's Association. There was correspondence to Council on that point to which I responded on behalf of the panel. But in any event we were not called upon to provide our views further and then in the Spring of this past year, in the meeting in Norfolk, there was a recommendation made which called for the individual transferable quota notion without limitations on it which would allow the very type of massive consolidation which the Panel had recommended against and which industry has lobbied against for the two prior years. And those of you who were there, I think everyone on Hearing Committee tonight was present then, you will recall that there was wide-spread industry opposition to the I.T.Q. proposal and to the history-based formula part of it. The staff was asked to come up with a new formula to present in Philadelphia last summer.

Well, after that meeting the Industry Panel decided that they would make one more effort to try to help the Council with understanding what industry's views were, and why industry had those views. And so, at the suggestion Mr. Jensen, the Surf Clam Committee Chairman, we convened a meeting in Baltimore in June of 1988 which all Industry Panel members attended. It was open to industry and quite a large number of fishermen attended. I believe there were twenty or thirty boat owners present as well. And we again went through the alternatives to an unlimited individual transferable quota system that we could propose to the Council. The bottom line is that within a year and a half ago that we felt a one-for-one consolidation under the present scheme was probably the best way to go at the present time.

Mr. Wallace alluded to this earlier, and I just want to put this in the record, because the response we got from the staff, from the Executive Director of the staff, I thought was rather curious and perhaps indicative of the kind of problems we are having today with the Council and the industry talking past each other. I received a personal letter when I had sent a letter out to the staff indicating we were going to have this panel meeting in Philadelphia, and I received a letter back from Mr. Bryson, in which he states, and I quote, "The proposed meeting was not requested nor cleared through the Chairman or the Executive Director as required. Therefore it cannot meet as a Council-constituted, body nor will report of the meeting to be received by the Council".

I guess this was somewhat upsetting to those of us on the Industry Panel who were doing this at our own expense. And we thought we were doing this to try and help Mr. Bryson and his staff to develop a plan that would be acceptable to industry. And because of that we were somewhat alarmed by the nature and tone of the response. As a matter of fact, because of the attitude of the Executive Director, we were not permitted to give a report of the meeting in Philadelphia last summer when the Amendment which is now being debated tonight, was considered by the whole Council.

However you'll recall that industry turned out in large numbers and once again everyone who spoke at that meeting, as best as I can recall, spoke in opposition to the history-based I. T. Q. formula, which is the very heart of this proposal. And it was at that meeting that Mr. Bryson and the Committee then had a "rump session"* that evening and came up with the idea of, well let's put all the formulas out. Since there seems to be a groundswell of opposition to the history-based I.T.Q., we will put all the formulas out and this would fragment the opposition and then everyone could have their say about what formula they want to use, but we'll still keep the guts of the program, that is an I.T.Q. with unlimited ability to transfer licences as the heart of the regulatory scheme. So that's what we have tonight. For the reasons that some of the speakers have already gone through this evening, I think it is as a practical matter, improper to have included all these formulas in the proposal. I think it legally impermissible as well, but that's an issue for another day.

The only point I wanted to make this evening, however, was that I believe the Council does have a legal obligation to consider the views of an advisory panel once it's been created. I believe that the Industry Advisory Panel has tried very hard to help the Council in developing a proposal that would be getting positive comments at these hearings and not be overwhelming, if not unanimous, opposition it's received at these four hearings. The Council and the staff chose not to do that and I think that the result that you have seen tonight and the result that you at the last three hearings was preordained in large part because of the attitude that those of us from the Industry Panel have had to deal with in trying to make our views heard and considered by the Council. Thank you.

Lee Anderson: That concludes the list of people who signed up. Is there anybody in the room who would like to speak? Please.

Paul Gensler: My name is Paul Gensler. I am with Sea Clams, Incorporated. This proposal is going to wipe out all of the New England fishermen, as far as I can see. It will at least set them back. And for me, I fish an inshore boat for most of the year. In the summertime, when I get good weather, I like to go to Nantucket Shoals and this Plan would put me out of business. Plus, most of the New England guys that I know, it would set them way back. So its unfair to the region, I believe. That's it. Thank you.

Lee Anderson: Thank you. Another individual back here, please.

Kenneth Gensler: I'm Ken Gensler, captain of the Merideth T. I am opposed to the Amendment also because the boat has only been set up for sea clamming the last two years, and we won't be allocated enough to make any of it even worth while. This is a brand new boat and there is no reason can't be out fishing, catching whatever it's capable of catching. And the weather limits us already to how many we could get and how often we can go. And I'm just opposed to it altogether myself, thank you.

Lee Anderson: Please. You are next, OK?

Gregory Ledsworth: I'm Greg Ledsworth, representing the F/V Jacqueline L. I believe we are one of the latest vessels to the clam industry in this area. I've been involved in the industry for going on nine years and I believe, in fact it would put us straight out with the industry. I've caught a lot of clams in the past, but the vessel has only been working since late 1987. That's the bottom line, it effectively would put us right out of business. The only recourse I would have is to fight it legally, and I would rather put my efforts into helping you come up with something than go that way. I just want to go on record. Thank you.

Lee Anderson: Thank you. Please (next speaker).

Thomas Keenan: Mr. Keenan, representing Pequot Sound Fisheries Ltd., which owns the ocean quahog catcher-processor, Rough Tide, read a statement urging the rejection of Amendment 8 because enactment of the ban against shucking at sea and the establishment of a system of individual boat allocations for ocean quahogs in Amendment 8 would be ruinous to his business and not be in the best interest of the surf clam and ocean quahog fishery. (Attachment 9)

Lee Anderson: Is there anyone else in the room who would like to make a comment?

Paul Gensler: Yes, actually, there is one more comment that I would like to make. Paul Gensler, Sea Clams, Inc. I was given the dice and not shown the playing board. If it hadn't been for the grapevine, I wouldn't have even known about this Amendment or about this meeting. I don't know why I am so ill-informed. I get my license but none of the rules. So I think something should be done about that so we have better communication. Thank you.

Lee Anderson: Other comments.

Please note that you have until March 31 to get your formal, written comments in. We will conclude the hearing now. All your comments have been recorded and summary minutes will be prepared. Thank you for coming.

ATTACHMENT 1: REMARKS FOR OPENING HEARINGS ON AMENDMENT #8

The objectives of the Plan are:

1. Conserve and rebuild Atlantic surf clam and ocean quahog resources by stabilizing annual harvest rates throughout the management unit in a way that minimizes short-term economic dislocations.
2. Simplify to the maximum extent the regulatory requirement of clam and quahog management to minimize the government and private cost of administering and complying with regulatory, reporting, enforcement, and research requirements of clam and quahog management.
3. Provide the opportunity for industry to operate efficiently, consistent with the conservation of clam and quahog resources, which will bring harvesting capacity in balance with processing and biological capacity and allow industry participants to achieve economic efficiency including efficient utilization of capital resources by the industry.
4. A management regime and regulatory framework which is flexible and adaptive to unanticipated short term events or circumstances and consistent with overall plan objectives and long-term industry planning and investment needs.

The management unit is all surf clams and all ocean quahogs in the Atlantic EEZ.

The preferred management measures are:

1 Catch limitations The annual Optimum Yield, Domestic Annual Harvest, Domestic Annual Processing, and annual quota for surf clams equal between 1,850,000 and 3,400,000 bu (approximately 31.5 - 57.8 million lbs). The annual Optimum Yield, Domestic Annual Harvest, Domestic Annual Processing, and annual quota for ocean quahogs range between 4.0 million bushels and 6.0 million bushels (approximately 40 - 60 million pounds of meats).

2. Permits and fees

Two permits are needed to fish for and land surf clams and ocean quahogs. One permit is a fishing vessel permit and the other is an allocation permit. Vessels taking surf clams or ocean quahogs for personal use are exempt from this requirement. Personal use is defined as the harvest of surf clams or ocean quahogs for use as bait, for human consumption, or for other purposes (not including sale or barter) in amounts not to exceed two bushels per person per trip.

A permit is also required to buy, receive, and process surf clams or ocean quahogs. This requirement is intended to apply to the entity that removes the surf clams or ocean quahogs from the cages, not to intermediaries who may possess the surf clams or ocean quahogs from the time the cages leave the fishing vessel until they are in the custody of the entity that removes them from the cages, nor to entities which may possess the surf clams or ocean quahogs subsequent to the time they are initially removed from the cage.

2.1. Vessel permits

Any vessel of the United States is eligible for a fishing vessel permit. Vessels previously in the fishery must have submitted all required logbook reports as of the date of the application.

The Regional Director may establish fees for the fishing vessel permit.

Fishing vessel permit applications are processed by the Regional Director. The application form shall require provision of at least the following information: names, addresses, and telephone numbers of the owner and operator; the name of the vessel; the vessel's US Coast Guard documentation number or State license number; engine and pump horsepower; home port of the vessel; directed fishery or fisheries; fish hold capacity (in cages or bushels); dredge size; and number of dredges. The vessel owner or operator is required to notify NMFS of any changes of address or physical characteristics of vessels.

A fishing vessel permit is valid only for the vessel for which it is issued.

The fishing vessel permit must be maintained in legible condition. The fishing vessel permit, the vessel, its gear, and catch are subject to inspection by any authorized official upon landing.

Fishing vessel permits expire on 31 December of each year.

Vessel owners or operators who apply for a fishing vessel permit under this section must agree as a condition of the permit that the vessel's fishing, catch, and pertinent gear (without regard to whether such fishing occurs in the EEZ or landward of the EEZ and without regard to where such surf clams, ocean quahogs, or gear

are possessed, taken, or landed) will be subject to all the requirements of this part. All such fishing, catch, and gear will remain subject to any applicable state requirements. If a requirement of this part and a management measure required by state law differ, any vessel owner or operator permitted to fish in the EEZ must comply with the more restrictive requirement.

Vessel permits may be suspended, revoked, or modified by the Regional Director for violations of this FMP.

2.2. Allocation permits

An allocation permit is necessary to land surf clams and ocean quahogs. An allocation permit takes the form of (1) an individual allocation certificate specifying the share of the annual surf clam and/or ocean quahog quota the allocation is worth, (2) surf clam and/or ocean quahog cage tags equivalent to the cages resulting from applying the individual allocation to the annual quota, and (3) any documentation issued by NMFS concerning the transfer of individual allocations and cage tags.

The Regional Director may establish fees for the allocation permit; that is, issuing the allocation permit document, issuing the annual allocation of cage tags, and issuing any documentation concerning the transfer of cage tags and allocations. Authorization to charge administrative costs includes allowing the Regional Director to arrange for cage tags to be produced by a specified vendor.

Only persons qualified to own permitted fishing vessels under United States law are eligible to own allocation permits.

Information concerning allocation permits is considered public information since it is information given to the fishermen by NMFS rather than information received from the fishermen, which is specified by the Magnuson Act as confidential.

2.2.2. Issuance of allocation permits

At the beginning of the first year following implementation of this Amendment, allocation permits will be issued to owners or operators of permitted vessels which harvested surf clams (based on logbook reports) between 1 January 1979 and 31 December 1987. The amount of the initial distribution (that is, the percentages shown on the individual allocation) will be based on one of the formulas described in section 9.1.2.4.

Prior to issuing the initial allocation permits, the Regional Director will inform each vessel owner or operator of the data upon which the allocation will be based (for example, logbook reports or vessel dimensions from the US Coast Guard documentation records, depending on the formula selected). Owners or operators will have 30 days to document if any of these data are incorrect and need to be changed.

Once the final annual quotas for surf clams and ocean quahogs have been published by the Regional Director for any year, NMFS will calculate the number of cage tags by applying the appropriate percentages (from the individual allocation) to the annual quota for both species. These bushel allocations will then be divided by 32 (bushels per cage) to yield the appropriate number of cages for which cage tags may be issued. The cage tags are valid only for the calendar year for which they are issued. Surf clam tags may not be used on cages containing ocean quahogs and ocean quahog tags may not be used on cages containing surf clams.

There are no restrictions on the permissible use of the quota (that is, an owner does not have to harvest his or her share) or on the time of harvest other than it must be landed in a permitted vessel during the year for which the tags were issued. An owner may obtain a permitted vessel to harvest his or her allocation or he or she may contract for the allocation to be caught by any permitted vessel. However, the allocation may be reduced by NMFS for violations of the MFCMA.

2.2.3. Transfer of allocation permits

2.3.2.2.3.1. Surf clams years 1, 2, and 3

Following the initial allocation, two surf clam allocation permits could be combined on any one vessel for each of the three years following implementation of this Amendment. Vessels may be replaced but cage tags may not be transferred if allocation permits are not combined.

2.3.2.2.3.2. Surf clams years 4 and subsequent

As of the beginning of the fourth year, allocation permits (either individual allocations or cage tags) could be transferred (in quantities of not less than 5 cages). Transfers would not be final until the person making the transfer had received approval from NMFS. After the phase in period there would be no limitations on vessels; that is, permitted vessels could be replaced and new vessels could be issued permits, the only limitation

being that a vessel could not land surf clams without a fishing vessel permit and cage tags for each standard cage or portion of cage landed.

Surf clam cage tags may be transferred to other individuals after the end of the three year phase in period in quantities not less than 5 cages.

2.3.2.2.3.3. Ocean quahogs all years

Following the initial allocation, ocean quahog allocation permits (either individual allocations or cage tags) could be transferred. There would be no limitations on vessels except that a vessel could not land ocean quahogs without a fishing vessel permit and cage tags for each standard cage or portion of cage landed. Since there would be no limit on ocean quahog allocation transfers, boats with surf clam and quahog allocations could transfer the quahog allocations (in quantities not less than 5 cages). Transfers would not be final until the person making the transfer had received approval from NMFS.

Ocean quahog cage tags may be transferred to other individuals upon implementation of this Amendment in quantities not less than 5 cages.

2.3.3. Effort restrictions

Fishing for surf clams and ocean quahogs is permitted seven days per week.

2.3.4. Size restriction

There is a surf clam minimum size limit of 4.75", which is the size of maximum yield per recruit. There is a tolerance of 50 undersized clams per cage. If any cage is in violation of the size limit, the entire load is in violation.

The surf clam minimum size limit may be suspended on a year to year basis unless 30% of the clams (based on a review by the Council of discard, catch, and survey data) are smaller than 4.75" (size of maximum yield per recruit) and the overall reduced size was not attributable to beds where growth of the individual clams had been reduced because of density dependent factors. It is the Council's intent that the size limit suspension would generally be in effect when the vast majority of the surf clams were larger than maximum yield per recruit size and would generally not be in effect when there were large numbers of small surf clams as a result of sets of large year classes. This process would be carried out as part of the annual quota setting process.

2.3.5. Specification and sources of pertinent fishery data

The reporting requirements continue with two changes (section 9.1). Dealers and processors must make their reports available for inspection by authorized officers or designated NMFS employees (the same requirement that has been in effect for vessel logbooks). Additionally, the allocation permit number must be reported on both the vessel logbook reports and the dealer/processor reports.

2.3.6. Other measures

All surf clam and ocean quahog cages shall be tagged from the time the surf clams or ocean quahogs are placed into the cage and tags shall not be removed until cages are emptied at the processing plant. Information to be shown on the tags shall be determined by the Regional Director, in consultation with the Council, but will include at least the information needed to establish a chain of evidence adequate for enforcement of the surf clam minimum size limit and the vessel allocation system from the vessel through the transportation system to the processor, inclusive. The Regional Director shall determine the minimum specifications of the tags, which as a minimum shall assure that markings are not erased prior to the cages being emptied at the processing plant.

No person shall possess a cage not containing surf clams or ocean quahogs with a tag.

No person shall possess a cage containing any surf clams or ocean quahogs without a tag from the time the surf clams or ocean quahogs are placed into the cage until the cage is emptied.

All surf clams and ocean quahogs landed in cages with federal cage tags are assumed to have been caught in the EEZ and are subject to the Federal size limit.

No person shall shuck surf clams or ocean quahogs at sea.

The Regional Director may require that vessel owners or operators notify NMFS in a manner and timing established by the Regional Director before a vessel departs the dock on a trip to harvest surf clams and ocean quahogs and before the vessel reaches the dock from a trip on which surf clams or ocean quahogs were caught.

The Regional Director may authorize experimental fishing not otherwise authorized by the regulations for the collection of fishery data. This provision is not included in the draft Plan at this time, but we would like comments through the hearings so the provision may be added in the final version of the Amendment.

ALLOCATION FORMULAS

9.1.2.4. Vessel allocations

9.1.2.4.1. General

The basic instrument (individual allocation) for allocating both surf clams and ocean quahogs will be denominated as a percentage of the total annual quota. Each year, owners of individual allocations will be issued cage tags which will allow them to harvest a given number of cages based on their percentage share. Allocations are on a percentage basis so that the amount of the allocation varies as the total quota varies from year to year. Surf clams and ocean quahogs may not be landed without appropriate tags attached to all cages containing clams or quahogs.

While the Council selected the allocation of both surf clams and ocean quahogs coastwide as the preferred alternative for this Amendment, the Council did not select a formula by which initial allocations would be made. Rather, five formulas have been identified for surf clams and four formulas have been identified for ocean quahogs. The Council is seeking comment on these alternative formulas through the review and hearing process.

9.1.2.4.2. Surf clam allocations

Five formulas were specified for allocating surf clams coastwide (that is, the New England and Mid-Atlantic Areas combined) pursuant to the preferred alternative. For all formulas, permitted vessels which harvested surf clams (based on logbook reports) between 1 January 1979 and 31 December 1987 are eligible for an initial allocation. For purposes of calculating historical participation, vessels that have replaced other vessels will be credited with the catch of the vessels they replaced. The formulas are:

1. **Historical Participation.** The initial distribution will be based on the percentage of the total catch of surf clams that the particular vessel caught (based on logbook reports) during the 1 January 1979 - 31 December 1987 period.

2. **Weighted History.** The initial distribution will be based on the percentage of the total catch of surf clams that the particular vessel caught (based on logbook reports) during the 1 January 1979 - 31 December 1987 period with 1985, 1986, and 1987 counted twice and the 2 worst years dropped. The result is calculated for each vessel and then summed for the fleet. Each vessel's sum divided into the fleet total to obtain the vessel's share.

3. **Adjusted History.** For vessels with permits to fish for surf clams and ocean quahogs in any Area (that is, vessels with permits issued pursuant to the moratorium; permits designated by NMFS as SF-1) the initial surf clam distribution would be based on the following formula:

   a. The surf clam catch (in bushels) that each permitted vessel caught (based on logbook reports) for calendar years 1979, 1980, 1981, 1982, 1983, 1984, 1985 (counted twice), 1986 (counted twice), and 1987 (counted twice) would be determined. This would result in 12 years of data (remember 1985, 1986, and 1987 are counted twice).

   b. The worst two years would be deleted from each vessel's history. The resulting number (in bushels) would be summed for the entire fleet and each vessel's ratio of the total calculated.

   c. The cost factor (vessel length x width x depth) of each vessel would be calculated, summed for the fleet, and each vessel's ratio to the total calculated. The vessel's historical ratio would contribute 90% to the vessel's initial allocation. The cost factor would contribute 10% to the vessel's initial allocation.

   For vessels with permits to fish for surf clams in only the New England Area (permits designated by NMFS as SF-7) the surf clam catch would be the average of the catch for the years actually fished between 1979 and 1987, inclusive. This number (in bushels) would be included in the total for the total surf clam fleet

(moratorium and New England Area only) to calculate the individual vessel's ratios. They would then be included with the moratorium vessels in the above allocation.

4. **Based on Adjusted History or Adjusted Cubic.** The initial distribution will be based either on:

   a. 90% on the percentage of the total catch of surf clams that the particular vessel caught (based on logbook reports) during the 1 January 1979 - 31 December 1987 period with 1985, 1986, and 1987 counted twice and the 2 worst years dropped and 10% on the percentage of the total volume (length × width × depth) of all permitted vessels that the particular vessel's volume represents, or;

   b. 10% on the percentage of the total catch of surf clams that the particular vessel caught (based on logbook reports) during the 1 January 1979 - 31 December 1987 period with 1985, 1986, and 1987 counted twice and the 2 worst years dropped and 90% on the percentage of the total volume (length × width × depth) of all permitted vessels that the particular vessel's volume represents, whichever is best for the vessel.

   Adjustments necessary to rationalize the fleet total allocation with the quota will be made.

5. **Allocations Based on Vessel Cubic Dimensions.** The initial distribution will be based on the percentage of the total volume (length × width × depth) of all permitted vessels that the particular vessel's volume represents.

9.1.2.4.3. Ocean quahog allocations

Four formulas were specified for allocating ocean quahogs coastwide pursuant to the preferred alternative. For all formulas, permitted vessels which harvested ocean quahogs (based on logbook reports) between 1 January 1979 and 31 December 1987 are eligible for an initial allocation. For purposes of calculating historical participation, vessels that have replaced other vessels will be credited with the catch of the vessels they replaced. The formulas are:

1. **Allocations Based on Historical Participation.** The initial distribution will be based on the percentage of the total catch of ocean quahogs that the particular vessel caught (based on logbook reports) during the 1 January 1979 - 31 December 1987 period.

2. **Based on Weighted History.** The initial distribution will be based on the percentage of the total catch of Mid-Atlantic Area surf clams that the particular vessel caught (based on logbook reports) during the 1 January 1979 - 31 December 1987 period with 1985, 1986, and 1987 counted twice and the 2 worst years dropped. The result is calculated for each vessel and then summed for the fleet. Each vessel's sum divided into the fleet total to obtain the vessel's share.

3. **Allocations Based on Vessel Cubic Dimensions.** The initial distribution will be based on the percentage of the total volume (length × width × depth) of all permitted vessels that the particular vessel's volume represents.

4. **Average of Years Fished.** For vessels with permits to fish for ocean quahogs (permits designated by NMFS as SF-7) the initial ocean quahog distribution would be based on the following formula:

   a. The average ocean quahog catch (in bushels) that each permitted vessel caught (based on logbook reports) for those years the vessel actually reported landings for calendar years 1979 through 1987 would be determined.

   b. The sum of all of the vessels' averages would be divided into each vessel's average to calculate each vessel's ratio of the total.

   c. The ratio would be applied to each year's annual quota to calculate each vessel's annual allocation.

Alternatives to the Proposed Plan

The alternatives to the proposed Amendment considered by the Council were:

1. Take no action at this time

2. Permit Unlimited Access to the Surf Clam Fishery and Eliminate Effort Restrictions This alternative would eliminate effort restrictions and entry limitations. The New England and Mid-Atlantic Areas would be com-

bined, so the OY would be revised and the surf clam minimum size limit would apply throughout the management unit. Reporting requirements would continue unchanged.

3. Institute a transferable allocation system in the Mid-Atlantic surf clam fishery only - Initial allocations would be based on either: historical participation, vessel dimensions, or a vessel's best trip - Management of ocean quahogs and New England surf clams would remain unchanged

FORMULAS FOR INITIAL ANNUAL ALLOCATION OF MID-ATLANTIC AREA SURF CLAMS

1. Allocations Based on Historical Participation
2. Based on Weighted History
3. Allocations Based on Vessel Cubic Dimensions
4. Allocations Based on a Vessel's Best Trip
5. Based on Best of Historical Participation or Cubic

4. Institute a moratorium on entry of new vessels into the ocean quahog fishery Initially there would be only a moratorium on entry of additional vessels into the ocean quahog fishery. To qualify for a permit under this moratorium, a vessel must currently hold a valid permit under the moratorium on entry of vessels into the Mid-Atlantic Areas surf clam fishery, or must have recorded logbook landings of ocean quahogs during the period 1 January 1979 through 31 December 1987, or must be documented as being under construction or being rerigged for the ocean quahog fishery as of 31 December 1987. After two years of operation under this moratorium there would be an allocation, with the initial ocean quahog distribution based on the following formula:

1. The average ocean quahog catch (in bushels) that each permitted vessel caught (based on logbook reports) for those years the vessel actually reported landings for calendar years 1979 through 1987 would be determined.

2. The sum of all of the vessels' averages would be divided into each vessel's average to calculate each vessel's ratio of the total.

3. The ratio would be applied to each year's annual quota to calculate each vessel's annual allocation..

Following the initial allocation, ocean quahog allocations could be transferred. There would be no limitations on vessels except that a vessel could not land ocean quahogs without an allocation. Since there would be no limit on ocean quahog allocation transfers, boats with surf clam and quahog allocations could transfer the quahog allocations (except for trading rules as yet to be determined), even if the surf clam the phase in period is still in effect.

5. Institute a trip limit system in the Mid-Atlantic surf clam fishery only - Vessel trip limits would be based on either vessel cubic dimensions or best historical trip - Management of ocean quahogs and New England surf clams would remain unchanged

This alternative is the same as the regime currently in effect except that the hourly limitations in the Mid-Atlantic Area surf clam fishery would be replaced with vessel trip allocations. Vessels may be replaced without limit, but the trip limit will remain the same as that of the retiring vessel.

Two trip limits may be consolidated on one vessel, except that the receiving vessel may only get 60% of the trip limit of the retiring vessel No vessel may have more than two trip limits. The 40% loss would be reallocated to the remaining vessels by NMFS.

6. Revise current time based system in the Mid-Atlantic surf clam fishery to allow owners of multiple vessels to consolidate their allowable trips on the vessels they currently own, or on to another hull they may acquire This alternative is the same as the regime currently in effect with some measures revised to reduce governmental involvement and facilitate efficiency in the fishery. Vessel owners would be allowed to consolidate their allowable trips onto other vessels they own, providing the vessel receiving the permit is of equal or smaller fishing capacity than the vessel from which the permit is removed.

Phase In The preferred alternative includes the provision of a three year (section 9.1 2) period during which surf clam vessels could be combined on a 2 for 1 basis each year. Individual surf clam allocations and individual surf clam quotas would be coupled to the vessels during this three year period. Beginning with the fourth

year individual surf clam allocations and individual surf clam quotas could be traded freely (in quantities no smaller than 5 cages). There is no phase in proposed for ocean quahogs, so individual ocean quahog allocations and individual ocean quahog quotas could be traded freely (in quantities no smaller than 5 cages) as of the first day the Amendment is in effect. The allocation formulas could be implemented with or without a phase in. The Council is seeking comment on this issue.

Every FMP and amendment must comply with the Magnuson Act, including the national standards. The test of any option is not necessarily how popular it is, but the extent it satisfies the law. The National Standards are:

1. Conservation and management measures shall prevent overfishing while achieving, on a continuous basis, the optimum yield from each fishery.

2. Conservation and management measures shall be based upon the best scientific information available.

3. To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.

4. Conservation and management measures shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such a manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

5. Conservation and management measures shall, where practicable, promote efficiency in the utilization of the fishery resources; except that no such measure shall have economic allocation as its sole purpose.

6. Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.

7. Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

Evaluation of Allocation Formulas

MFCMA SEC. 303(b)(6). Contents of Fishery Management Plans, Discretionary Provisions. Any fishery management plan which is prepared by any Council, or by the Secretary, with respect to any fishery, may establish a system for limiting access to the fishery in order to achieve optimum yield if, in developing such system, the Council and the Secretary take into account

(A) present participation in the fishery,

(B) historical fishing practices in, and dependence on, the fishery,

(C) the economics of the fishery,

(D) the capability of fishing vessels used in the fishery to engage in other fisheries,

(E) the cultural and social framework relevant to the fishery, and

(F) any other relevant considerations

A key issue is which formula best satisfies these criteria.

With regard to the preferred alternative, we believe it meets the requirements of the statute better than any of the alternatives (in Appendix 1). Some of the formulas proposed in conjunction with the preferred alternative may satisfy the statute, some may not. Generally, the formulas must be connected with items A through F above, such as those with a history basis. Others, such as plain cubic or the formulas that say pick the better of two factors, do not meet the tests of the statute.

Early in the development of Amendment #8 there was concern about satisfying the "excessive share" prohibition of standard 4. The FMP states "The Council does not believe that the preferred alternative will create conditions fostering inordinate control, by buyers or sellers, that would not otherwise exist.

APPENDIX 6. RESPONSES TO PUBLIC COMMENTS ON AMENDMENT #8

COMMENT: The Council's system of transferable allocations is not authorized under the Magnuson Act, as it refers to the allocation of fishing "privileges" and the "opportunity to participate," and not the granting of harvest rights.

RESPONSE: Section 303(b) of the Magnuson Fishery Conservation and Management Act (MFCMA) provides:

> (b) DISCRETIONARY PROVISIONS. Any fishery management plan which is prepared by any Council, or by the Secretary, with respect to any fishery, may ...
>
> (6) establish a system for limiting access to the fishery in order to achieve optimum yield if, in developing such system, the Council and the Secretary take into account
>
> (A) present participation in the fishery,
>
> (B) historical fishing practices in, and dependence on, the fishery,
>
> (C) the economics of the fishery,
>
> (D) the capability of fishing vessels used in the fishery to engage in other fisheries,
>
> (E) the cultural and social framework relevant to the fishery, and
>
> (F) any other relevant considerations;

National Standard 4 of the Magnuson Act states:

> Conservation and management measures shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be: (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

National Standard 5 of the Magnuson Act states:

> Conservation and management measures shall, where practicable, promote efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.

NMFS guidelines for the national standards [50 *CFR* 602.14(c)] state:

> An FMP may contain management measures that allocate fishing privileges if such measures are necessary or helpful in furthering legitimate objectives or in achieving the OY, and if the measures conform with paragraphs (c)(3)(i) through (iii) of this section.
>
> (1) Definition. An 'allocation' or 'assignment' of fishing privileges is a direct and deliberate distribution of the opportunity to participate in a fishery among identifiable, discrete user groups or individuals. ...

Additionally, under the discussion of standard 5 [50 *CFR* 602.15(c)]:

> (c) *Limited access.* A "system for limiting access," which is an optional measure under section 303(b) of the Act, is a type of allocation of fishing privileges that may be used to promote economic efficiency or conservation. For example, limited access may be used to combat overfishing, overcrowding, or overcapitalization in a fishery to achieve OY. In an unutilized or underutilized fishery, it may be used to reduce the chance that these conditions will adversely affect the fishery in the future, or to provide adequate economic return to pioneers in a new fishery. In some cases, limited entry is a useful ingredient of a conservation scheme, because it facilitates application and enforcement of other management measures.
>
> (1) *Definition.* Limited access (or limited entry) is a management technique that attempts to limit units of effort in a fishery, usually for the purpose of reducing economic waste, improving net economic return to the fishermen, or capturing economic rent for the benefit of the taxpayer or the consumer. Common forms of limited access are licensing of vessels, gear, or

fishermen to reduce the number of units of effort, and dividing the total allowable catch into fishermen's quotas (a stock certificate system). Two forms (i.e., Federal fees for licenses or permits in excess of administrative costs, and taxation) are not permitted under the Act.

(2) *Factors to consider.* The Act ties the use of limited access to the achievement of optimum yield. An FMP that proposes a limited access system must consider the factors listed in section 303(b)(6) of the Act and in section 602.14(c)(3) of these guidelines. In addition, it should consider the criteria for qualifying for a permit, the nature of the interest created, whether to make the permit transferable, and the Act's limitation on returning economic rent to the public under section 304(d)(1). The FMP should also discuss the costs of achieving an appropriate distribution of fishing privileges.

Clearly, the NMFS interpretation [50 *CFR* 602.15(c)(1)] of the MFCMA allows for the type of allocation system proposed in Amendment #8.

NMFS has interpreted the provision at §303(c)(1) which allows limiting access to a fishery to permit per vessel catch limits. This interpretation has been operative since 1983. It appears at 50 CFR §602.15(c)(1). The legislative history of the Magnuson Act at page 691 is the basis for this interpretation.

COMMENT: No scientific data supporting the need for an allocation.

RESPONSE: The Amendment clearly demonstrates the serious overcapitalization of the fishery which the allocation scheme is proposed to remedy. This is a sufficient scientific basis under the Act. Not every management measure that may be implemented under the Magnuson Act must be founded upon a biological basis. This is amply demonstrated by the fact that the focal point of any management scheme, the optimum yield, is a biological concept which may be modified by relevant social, economic, and ecological factors. The scientific basis of any management measure may include a consideration of these factors.

COMMENT: The Council's allocation system does not meet with national standards because it does not actively discourage the acquisition of excessive shares.

RESPONSE: National Standard 4 of the Magnuson Act states that any allocation of fishing privileges must be "... (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges." The NMFS guidelines [50 *CFR* 602.14(c)] further state: "An allocation scheme must be designed to deter any person or other entity from acquiring an excessive share of fishing privileges, and to avoid creating conditions fostering inordinate control, by buyers or sellers, that would not otherwise exist."

The key phrase is "that would not otherwise exist". While it is difficult to document ownership precisely since records generally show a separate owner for each vessel, in fact most vessels are owned by individuals or organizations that own more than one vessel. A significant portion of the active fleet is owned by a small number of entities, while very few vessels are in single ownership. Given that situation, the definition of excessive shares in the surf clam and ocean quahog fishery becomes a significantly different matter than defining excessive shares in the northeast multi-species fishery, where there are over a thousand vessels individually owned.

The allocation process must be viewed as containing two distinct phases. The first phase consists of the initial distribution of quota shares as specified in the final FMP. The second phase is the redistribution of those shares among the owners through trading.

The first phase of initial distribution is clearly the responsibility of NMFS and the Council, and efforts have been made to devise an allocation formula which is both fair and equitable as well as providing no particular entity with an excessive share by basing the allocation formula largely on historical catch.

As regards the second phase of trade among owners, the Council's position is that antitrust laws are already in force which would cover the abuse of excessive shares. There are many examples of allocation of public resources (taxi medallions and timber land) where excessive shares are not a problem.

Pursuant to 50 CFR §602.14, an allocation scheme must be designed to not give people an excessive share of the resource and to avoid conditions fostering inordinate control, by buyers or sellers that would not otherwise exist. The allocation system is not conducive to people acquiring excessive shares to any greater extent than the current circumstances of the fishery permit. Currently, someone with enough cash could buy up most of the fleet. Roughly forty five percent of the vessels in the fleet are owned by three individuals. The processing sector is also very concentrated. Currently, the value of a moratorium permit in the fishery is

around $75,000-100,000. The value attached to the permit will now be transferred to the allocation. The asking price for an allocation will not be cheap. The criteria in any one of the formulas presented does not allow anyone to get an excessive share of the fishery. The Act does not intend that secondary economic forces which might concentrate the quota in a few individuals have to be prevented by the Amendment.

COMMENT: Lumping the two fisheries together fails to take into account the variations in the fisheries and probably violates the National Standards.

RESPONSE: This complaint ignores the facts. These fisheries are prosecuted by the same vessels for the most part. There were only three vessels that fished exclusively for quahogs in 1987. Clams and quahogs compete with one another in certain product markets (for example, chowders). Proposing allocations of quahogs does not frustrate the considerations of variations in either fishery. Limiting entry into the quahog fishery through allocations should preclude any instability in the fishery represented by a large influx of new entrants.

COMMENT: The formulas are not fair and equitable as required by National Standard 4.

RESPONSE: Some of the formulas are more fair and equitable than others. The Council has the discretion to decide which formulas best suits the attainment of the goals of the Amendment by reflecting a consideration of those factors in 303(b)(6). The fact that some may be disadvantaged under some formulas is not fatal to the Amendment. The Council is free to interpret how it will consider those factors in the aforementioned section, as long as there is a record of why such factors are considered, and how much weight was accorded to them, and why some are either not considered or discounted greatly. Factors such as catch records, vessel size, years in the fishery, breakdown, etc., are legitimate considerations in developing a formula. The tough part is to come up with a formula that strikes a balance among those that have performed well in the fishery for years, made large investments in vessels whether recently or in the past, suffered long breakdowns or loss of markets, or turned a vessel's catch performance around, while not unjustly enriching those that have not really participated in the fishery but seek to capitalize on their moratorium permit. The Council has the discretion to decide which factors merit consideration, and how much.

COMMENT: The history based formulas allocate the resource to vessels not fishermen. This is contrary to the intent of the Magnuson Act which talks about allocations to fishermen.

RESPONSE: Under the discussion of standard 5 [50 *CFR* 602.15(c)(1)], quoted fully above:

> (1) *Definition.* Limited access (or limited entry) is a management technique that attempts to limit units of effort in a fishery, usually for the purpose of reducing economic waste, improving net economic return to the fishermen, or capturing economic rent for the benefit of the taxpayer or the consumer. Common forms of limited access are licensing of vessels, gear, or fishermen to reduce the number of units of effort, and dividing the total allowable catch into fishermen's quotas (a stock certificate system). Two forms (i.e., Federal fees for licenses or permits in excess of administrative costs, and taxation) are not permitted under the Act.

The proposal in Amendment #8 is a stock certificate system.

COMMENT: The history based formula for surf clams is unfair because it makes insufficient allowance for recent entrants and rewards vessels which have fished illegally.

RESPONSE: The enabling legislation for limited entry and allocations is MFCMA 303(b)(6). The allocation portion of the issue is governed by national standard 4. The NMFS interpretation of the fair and equity test of standard 4 [50 *CFR* 614(c)(3)(i)] states:

> (i) *Fairness and equity.*
>
> (A) An allocation of fishing privileges should be rationally connected with the achievement of OY or with the furtherance of a legitimate FMP objective. Inherent in an allocation is the advantaging of one group to the detriment of another. The motive for making a particular allocation should be justified in terms of the objectives of the FMP; otherwise, the disadvantaged user groups or individuals would suffer without cause. For instance, an FMP objective to preserve the economic status quo cannot be achieved by excluding a group of long time participants in the fishery. On the other hand, there is a rational connection between an objective of harvesting shrimp at their maximum size and closing a nursery area to trawling.
>
> (B) An allocation of fishing privileges may impose a hardship on one group if it is outweighed by the total benefits received by another group or groups. An allocation need not preserve the status quo in the fishery to qualify as "fair and equitable," if a restructuring of fishing

privileges would maximize overall benefits. The Council should make an initial estimate of the relative benefits and hardships imposed by the allocation, and compare its consequences with those of alternative allocation schemes, including the status quo. Where relevant, judicial guidance and government policy concerning the rights of treaty Indians and aboriginal Americans must be considered in determining whether an allocation is fair and equitable.

Given the above, the "fairness" test of any allocation system is the balance between "present participation in the fishery" and "historical fishing practices in, and dependence on, the fishery" and how those factors are specified. The Council did not adopt a single allocation formula in the hearing draft of Amendment #8, but rather put forth a series of alternatives for comment. In response to the comments made during the review process, the Council adopted a formula that is based 80% on historical catch and 20% on vessel size (rather than the 90% history - 10% vessel size formula in the hearing draft) and adds 1988 to the 1979-1987 historical period included in the hearing draft. These changes are designed to respond to the above comment.

The entire process is a delicate balancing act which is ultimately a zero sum game that leaves no one happy or satisfied, for every accommodation of interest or grievance which the Council makes must take surf clams or ocean quahogs from one individual or group in order to give them to another.

Almost everyone, so many allege, in the industry has violated the regulations. It is impossible to determine the degree to which any one vessel was involved in violations. It might be a factor for discounting catch history, buy certainly not by much.

The Council is simply in the position of being required to use its best judgement as to which balance of arguments is the most fair, in full knowledge of the fact that that judgment will be, at least in part, subjective. Perceptions of fairness are personal, not universal, and influenced by the circumstances in which we each find ourselves. The Council is being asked to make this judgement, rather than industry alone, because it does not have a personal stake in its outcome. The Council's decision will be reviewed by NMFS and the Secretary of Commerce for consistency with the national standards, and be open to further public comment as well.

The Council has responded to this concern by adding 1988 to the 1979-1987 base in the hearing draft and by counting 1988 twice in the formula for the Mid-Atlantic Area surf clam vessels and by deleting the year with the lowest non-zero catch for New England Area surf clam vessels and for ocean quahog vessels.

COMMENT: The institution of processor permits and requirement that processors make reports available to on site inspectors unnecessarily duplicates current regulatory requirements and increases the regulatory burden on processors.

RESPONSE: In changing the surf clam management regime from a time based system to one of transferable allocations, the enforcement requirements shift from monitoring vessels at sea to tracking the movement and ownership of the surf clams and ocean quahogs themselves. Profit incentives change from fishing beyond allowable hours and inside closed areas to harvesting and selling more surf clams or ocean quahogs than one is entitled by their allocation.

Efficiency in enforcement efforts dictates that they center on the processing plants to which the surf clams and ocean quahogs must inevitably flow. The success or failure of the plan will hinge on processors keeping the system honest by refusing to buy unauthorized surf clams or ocean quahogs. To motivate diligence on the part of processors, it is necessary to have written records of purchases and sales available for enforcement officials' inspection. It is also necessary that enforcement have a credible penalty which can be applied to processors who violate the law.

For many years, permit sanctions have been a possible penalty for violations of the law, as well as fines and catch seizure. Shutting down a vessel's operations for a period of time has proven to be a potent deterrent to breaking the law, and would be equally effective for processors. It is a prudent and reasonable measure, which imposes no significant additional regulatory burden on processors.

COMMENT: A ban on shucking at sea is arbitrary and capricious because it ignores recent investment in catcher shucker vessels and the increasing difficulties which shoreside plants have had in meeting environmental pollution standards.

RESPONSE: A ban on shucking at sea was originally conceived to facilitate the enforcement of allocations, and avoid the problem of making shoreside determinations of how many bushels had been harvested when the product was no longer in the shell. As with sea scallops, seasonal variations in meat yield complicate an

accurate calculation of harvested volume or weight. Additionally, each processing vessel would likely operate at different levels of recovery (the amount of meat that would be retained).

In response to this concern, the Council voted that the Regional Director may allow shucking at sea if observers on the boats under the NMFS Observer Policy, with the vessel operator paying the cost of the observer or, with the concurrence of the Council, if an appropriate formula to convert shucked meat weight into cage units can be developed . This would ensure that accurate records were kept on the quantity of harvests. Since the operator would have decreased costs in terms of pollution control at on shore plants and lower transportation costs (finished product versus shell stock), it is likely there would be a cost saving, even including the cost of the observer.

COMMENT: A ban on shucking at sea runs contrary to environmental legislation prohibiting shucking on shore. The prohibition runs contrary to the Act's prohibition on limiting cost effective processing techniques absent any social or conservation concerns.

RESPONSE: The legislation referred to has not been specified. This comment makes one question whether we are trading one degradation for another in the interest of saving money by not having to install a waste water treatment facility at the plant. In any event, shucking at sea is allowed under specified conditions.

COMMENT: There is no justification for including ocean quahogs in an allocation program because the resource is in no imminent danger of being overharvested, and the industry did not have sufficient notice that such a measure was being contemplated by the Council.

RESPONSE: The inclusion of ocean quahogs in an allocation program at this time would avoid the problems with time management which the Council and industry have experienced with surf clams. Ocean quahogs landings has been increasing over time, particularly since 1984 when effort limitations on surf clams became more restrictive. It is possible that the maximum quota of six million bushels for ocean quahogs could be taken within the next few years. Clearly, it is preferable to design and implement the appropriate long term management strategy *before* this segment of the fishery becomes more overcapitalized, and effort limitations become necessary which will reduce their efficiency and profitability. Public discussions of a potential moratorium on ocean quahogs date back to at least 1982.

A concern for the ocean quahog fishery involves potential industry reactions to the postponement of allocation management. Industry has been aware for a decade that the Council is looking closely at vessel catch histories in meeting the requirements of the Magnuson Act to take into account "historical fishing practices in, and dependence on, the fishery" when designing allocation management systems. In order to eventually obtain a larger initial allocation, vessels have already started taking more quahog trips to build up their catch histories, which at the same time has the effect of accelerating the progression to a point where an allocation system is needed. Integrated firms which have better access to quahog markets will have a competitive advantage during this buildup, and can be expected to buy preferentially from their own boats. Independent harvesters, therefore, would be disadvantaged both in the short term (by not being able to sell the quahogs they catch now) and in the long term (by getting smaller allocations as a result or by being forced out be not having a market during the moratorium period).

The point is simply that there are risks associated with postponing allocation management for ocean quahogs.

Under the discussion of standard 5 [50 *CFR* 602.15(c)]:

> (c) *Limited access.* A "system for limiting access," which is an optional measure under section 303(b) of the Act, is a type of allocation of fishing privileges that may be used to promote economic efficiency or conservation. For example, limited access may be used to combat overfishing, overcrowding, or overcapitalization in a fishery to achieve OY. In an unutilized or underutilized fishery, it may be used to reduce the chance that these conditions will adversely affect the fishery in the future, or to provide adequate economic return to pioneers in a new fishery. In some cases, limited entry is a useful ingredient of a conservation scheme, because it facilitates application and enforcement of other management measures.

Clearly, the NMFS interpretation [50 *CFR* 602.15(c)] of the MFCMA allows for limiting entry prior to the time when the catch reaches the maximum possible quota or when the resource is over fished.

In 1988, 62 vessels caught 4,469,373 bushels of ocean quahogs at a price of about $2.88 per bushel. Given the Council's adopted allocation formulas, 160 vessels would be eligible for an allocation of surf clams, ocean quahogs, or both, with 117 of those eligible for an ocean quahog allocation. However, 1,105 vessels have val-

id ocean quahog permits. Since there is currently no limit on entry into the ocean quahog fishery, the number of permitted vessels can grow at any time.

COMMENT: Quahog allocation should not be instituted without reducing the quota first.

RESPONSE: There is a suggestion that the Council must first look at other measures which it has employed in the surf clam fishery (that is, quota reduction and a moratorium) because it is bound to follow its past practices. Fisheries management is dynamic, which if held to past practice, could well spell disaster for accomplishing fisheries management objectives. In any event, the circumstances of the surf clam fishery in 1977, when the moratorium was first imposed, are markedly different than the circumstances of the ocean quahog fishery in 1989, and, therefore, distinguishable. The Council has the discretion to manage the ocean quahog fishery by imposing those measures which it concludes are necessary and appropriate in light of the record.

COMMENT: The quahog allocation is solely for economic purposes.

RESPONSE: The allocation system is intended to forestall a problem. Fishermen contemplating that an early closure may result could increase their fishing effort to capture as much of the quota as possible. The allocation system will prevent an arms race and maintain the integrity of the overall quota.

COMMENT: The New England surf clam and ocean quahog fisheries have been managed separately from the Mid-Atlantic fisheries since Amendment 2. The conditions justifying separate management areas at that time still exist today.

RESPONSE: The essential issue involves national standard 3 [(50 *CFR* 602.13(a) and (b)]:

> (a) *Standard 3.* To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.
>
> (b) *General.* The purpose of this standard is to induce a comprehensive approach to fishery management. The geographic scope of the fishery, for planning purposes, should cover the entire range of the stock(s) of fish, and not be overly constrained by political boundaries. Wherever practicable, an FMP should seek to manage interrelated stocks of fish.

The initial FMP established a coastwide management regime, including annual and quarterly quotas for surf clams, annual quotas for ocean quahogs, a moratorium on entry of new vessels into the surf clam fishery, effort limitations in the surf clam fishery, and vessel and processor reporting. Soon after implementation of the FMP in 1977 the New England Council proposed that the surf clam fishery off New England be exempt from the vessel moratorium and effort limitations because these measures were seen as an impediment to development of the fishery off New England. Amendment #2 created a New England Area, with a quota separate from the rest of the fishery (the Mid-Atlantic Area). Amendments #6 and #7 further revised the system to subdivide the New England Area into the Georges Bank and Nantucket Shoals Areas, with separate quotas and management regulations.

From a permitting standpoint, vessels with permits issued under the original FMP (that is, under the moratorium) may fish in all three Areas for both surf clams and ocean quahogs. Vessels with permits for the New England Area may fish for surf clams only in the Nantucket Shoals and Georges Bank Areas. Vessels with permits for only ocean quahogs may fish for ocean quahogs coastwide.

The issue with Amendment #8 is whether uniform regulations should be reimposed coastwide. National standard 3 says they should be. As noted above, the desire to allow development of the New England area fishery was adequate reason in Amendment #2. The Amendment #8 argument is that the general overcapitalization situation in the fishery exists without regard for area boundaries and the exemption from national standard 3 is no longer valid.

Of the approximately 12 vessels based on New England that were permitted under the original FMP, 4 remain. In 1988, 11 vessels reported landing surf clams from the New England Area, 9 based in New England and 2 based in the Mid-Atlantic.

The Mid-Atlantic Council maintains the firm belief that it is in the best interests of New England fishermen that unified management of both Areas be reinstituted as recommended in Amendment #8. It is a virtual certainty that once consolidation of the Mid-Atlantic fleet has occurred, many of the remaining vessels will fish the unrestricted grounds of New England. Under Amendment #7, there is no protection available to New England boats that will prevent Mid-Atlantic vessels from catching the New England quotas in advance of local vessels. Note that there is a belief that consolidation would result in allocations going to the largest

Mid-Atlantic vessels, with the surplus vessels being the least effective. However, it is likely that allocations would be assigned to the most efficient vessels, since time would no longer be a constraint, leaving the newer, larger vessels designed to catch the most surf clams per unit of time, surplus to fish in the New England Area or fish for quahogs. Since the surf clam market is finite, these vessels fishing in the New England Area could take market away from local boats as well as accelerate catching the quota.

While it may be argued that spreading the quotas throughout the year in equal quarterly quotas has decreased the incentives for a massive pulse fishery from the Mid-Atlantic, it should be remembered that for a number of surplus Mid-Atlantic vessels there will be almost nothing to lose. New England fishermen will note that *Mid-Atlantic* fleet owners are joining them in their chorus to leave the Areas separate. Under the adopted Amendment #8, however, New England fishermen are guaranteed allocations of surf clams equal to the average of their years fished.

Enforcement is also a serious concern which has not been adequately addressed from those advocating separate management regimes. There will be a substantial incentive for illegally caught Mid-Atlantic surf clams to be mistagged as having been caught in New England. With enforcement focused on Mid-Atlantic processing plants, there will be little ability to distinguish whether the truck off-loading the surf clams is arriving from a Mid-Atlantic or New England port. This poses risks not only of exceeding the Mid-Atlantic Area quota, but New England fishermen face having their fisheries prematurely shut down because their quotas have been filled through misreporting.

COMMENT: The allocation system has no incentives to increase efficiency or to replace old vessels and would therefore increase safety hazards in the fisheries. There is no safety rationale for replacing the current time based system with an allocation system. There have been no vessels lost because of the restricted fishing time in the past four years, and further adjustments can be made in the time based system to increase vessel safety.

RESPONSE: A transferable allocation system allows for enormous increases in efficiency through the consolidation of allocations on to only as many vessels as are required to harvest them. Fishermen are also businessmen who realize their profits will be greatest when operating vessels at the least cost. Allocations will rapidly be shifted from old, inefficient vessels which have high insurance and maintenance costs, to more modern, efficient vessels.

The Council remains deeply concerned about the safety implications of fishery management decisions. Fishermen have repeatedly voiced concerns about the economic pressures they face which force them to fish in hazardous weather or lose a trip. When it is within the Council's power to alleviate these pressures, it is incumbent upon them to do so. Amendment #8 addresses both these issues in a way which gives maximum flexibility to the industry.

The Amendment will result in more safety problems only if you subscribe to the theory that the Amendment kills any incentive to build new boats.

COMMENT: The numerous formulas in the preferred alternative frustrate the industry's ability to thoroughly comment on the Amendment.

RESPONSE: The Magnuson Act requires the Council to allow individuals to participate in the development of a plan or amendment. The process of developing this Amendment has been one in which the industry has widely and often participated. There have been numerous committee and Council meetings at which the allocation schemes were discussed with industry members. The Council gave any industry member the exact allocation he/she would get under several of the different allocation schemes. The existence of a preferred alternative, being an allocation scheme, with several possible allocation formulas did not frustrate the industry's ability to comment on the Amendment. The hearing record, indeed the entire record of the Amendment's development is rife with comments on who would win and lose under the various allocation schemes. If there were procedural deficiencies, they certainly do not rise to the level of those alleged in the *Alaska Factory Trawlers* case in which approval of the FMP under attack was upheld by the court.

COMMENT: The Amendment fails to promote conservation.

RESPONSE: There is currently no shortage of either the surf clam or ocean quahog resource, therefore you do not need to put Amendment 8 into effect. In fact, some commenters allege that it has a negative effect because it allows the size limit to be suspended from year to year.

The current time base system demands that a vessel maximize its CPUE, but only in a six hour period. A vessel operator has virtually no time to search out beds which have fewer undersized clams. Consequently, the

present system results in a waste of the resource as boats have to discard large numbers of undersize clams if they are unable to fish on a bed with a preponderance of large clams. The size limit was originally set in response to a market demand. The original 5½" minimum size was set expressly to support the strip market. The minimum size of 4¾ represents the maximum yield per recruit. Suspending the surf clam minimum size should not have a deleterious effect on the resource, particularly with the provision for its reinstitution.

COMMENT: The cage tolerance is unreasonable.

RESPONSE: The complaint is that the 50 clam per cage tolerance at the 4¾" size limit is unreasonable. Interestingly enough, this provision has been in the regulations since 1985. It has not been challenged.

COMMENT: The Amendment fails to promote efficiency.

RESPONSE: Supposedly, the Amendment kills any incentive to build a better mousetrap, that is a more efficient vessel. The Council is proposing to go from a quarterly allocation system which has a vessel stand ready to fish a limited number of trips in each quarter to one in which the trips could be taken at any time. There are tremendous efficiencies realized under the consolidation provisions. Vessel owners can cut the fixed costs of vessel operations by combining several quotas on one vessel, or by using a vessel for only a limited time and either tying it up or exploring other fisheries in which it might be employed. This latter alternative is more realistic under the proposed allocation system, since the vessel's equipment would not have to be changed back and forth to take the allowable quarterly fishing trips. The bottom line is that fishermen will attempt to reduce their costs of catching their allocations. There is every incentive for fishermen to make changes to accomplish this objective.

COMMENT: Unlimited transferability will allow foreigners the opportunity to buy up the resource.

RESPONSE: They can also buy up other commodities in the U.S., provided they conform with the law.

COMMENT: Any attempt to restrict foreign ownership is bound to fail.

RESPONSE: Currently, the corporate owner of a domestic built hull that seeks documentation in the U.S. fisheries or the coastwide trade must meet certain domestic ownership requirements. The Council believes that the ownership of any quota should also be subject to this provision, since the Council views ownership of part of the quota as participation in a US fishery.

COMMENT: The formulas do not use 1989 and 1990 data.

RESPONSE: The Council must have the ability to draw a time line after which new data are not incorporated into the Amendment unless it reflects a drastic change in the fishery which requires a revision to the management scheme. See 50 CFR §602.12(b)(2).

COMMENT: Lack of a phase in period.

RESPONSE: A phase in period is discretionary. In any event, the industry has been on notice for several years concerning the possibility of per vessel allocations. There will be an administrative phase in period to set up the system's administration.

COMMENT: Unlimited transferability rewards wealth, not initiative, anyone with a large cash surplus can buy as much of the resource as they care to.

RESPONSE: Anyone with enough cash can now buy as many vessels as permit holders are willing to sell. The same will be true under an allocation system.

COMMENT: The Amendment fails to minimize administrative costs.

RESPONSE: The allegation is that the added regulatory burden represented by an allocation system for ocean quahogs will greatly increase costs. The additional costs represented by the new measures imposed on the ocean quahog fishery will be more than offset by the shift in focus away from at sea enforcement. The current time based system entails the use of vessels and aircraft to ensure its integrity. There are no greater enforcement costs than those associated with the use of these platforms. The enforcement of the allocation system will be done by dockside monitoring and auditing of vessel and dealer reports. The costs associated with dock side enforcement are small in comparison to at sea enforcement.

COMMENT: The anti-trust laws do not prevent concentrations.

RESPONSE: NMFS has interpreted the provision at §303(c)(1) which allows limiting access to a fishery to permit per vessel catch limits. This interpretation has been operative since 1983. It appears at 50 CFR §602.15(c)(1). The legislative history of the Magnuson Act at page 691 is the basis for this interpretation.

COMMENT: The quota will be given to some vessels that have not fished.

RESPONSE: Inactive vessels will get part of the quota. This is one of the concerns that is addressed in the adopted formula. Certainly, owners of inactive vessels should not get a windfall.

COMMENT: The proposed tagging requirement is burdensome, slowing fishing time and possibly requiring additional crew.

RESPONSE: Under the allocation system, time is not a factor. It is inconceivable that tagging a cage will require an additional crew member. However, the requirement has been changed from at sea to on the dock prior to the time when the cable is released from the cage.

APPENDIX 7. PART 652 - ATLANTIC SURF CLAM AND OCEAN QUAHOG FISHERIES (These regulations became effective 30 September 1990, except §652.20, which was effective 8 June 1990, and §652.23. which was effective 9 July 1990. §652.20(g) was no longer effective after 31 December 1990. Included are the call in requirements published at 58 FR 14340 effective 15 April 1993)

Subpart A - General Provisions

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Authority: 16 U.S.C. 1801 *et seq.*

Subpart A - General Provisions

§652.1 Purpose.

This part implements the Fishery Management Plan for the Atlantic Surf Clam and Ocean Quahog Fisheries as amended by the Mid-Atlantic Fishery Management Council in consultation with the New England Fishery Management Council. These regulations govern the conservation and management of surf clams and ocean quahogs.

§652.2 Definitions.

In addition to the definitions in the Magnuson Act, and in §620.2 of this chapter, the terms used in this part have the following meanings:

Bushel means a standard unit of measure deemed to hold 1.88 cubic feet (53.24L) of

surf clams or ocean quahogs in the shell.

Cage means a container with a standard unit of measure containing 60 cubic feet (1,700 L). The outside dimensions of a standard cage generally are 3' (91 cm) wide, 4' (122 cm) long and 5' (152 cm) high.

Council means the Mid-Atlantic Fishery Management Council.

Dealer means a person who receives surf clams and ocean quahogs for a commercial purpose other than transport on land and who does not remove them from the cage.

Fishing trip means a departure from port, transit to the fishing grounds, fishing, and a return to port.

Land or *landing* means to begin offloading surf clams or ocean quahogs, to offload surf clams or ocean quahogs, or to arrive in port with the intention of offloading surf clams or ocean quahogs.

Offload or *offloading* means to separate physically a cage from a vessel such as by the removal of the sling or wire used to remove the cage from the harvesting vessel.

Personal use means harvest of surf clams or ocean quahogs for use as bait, for human consumption, or for other purposes (not including sale or barter) in amounts not to exceed 2 bushels (106.48 L) per person per fishing trip.

Processor means a person who receives surf clams or ocean quahogs for a commercial purpose and removes them from a cage.

Regional Director means the Regional Director, Northeast Region, NMFS, One Blackburn Drive, Gloucester, MA 01930-2998. Telephone 508-281-9250.

§652.3 Relation to other laws.

The relation of this part to other laws is set forth in §620.3 of this chapter.

§652.4 Vessel permits.

(a) *General.*

(1) *Requirement.* Any vessel of the United States fishing for surf clams or ocean quahogs, except vessels taking surf clams or ocean quahogs for personal use or fishing exclusively within state waters, must have a permit issued under this section aboard the vessel.

(2) *Condition.* Vessel owners or operators who apply for a fishing vessel permit under this section must agree as a condition of the permit that the vessel's fishing, catch, and pertinent gear (without regard to whether such fishing occurs in the

EEZ or landward of the EEZ, and without regard to where such fish or gear are possessed, taken, or landed) will be subject to all the requirements of this part; provided, however, that such owners or operators fishing within waters under the jurisdiction of any State that requires cage tags shall not be subject to conflicting Federal minimum sizes or tagging requirements. All such fishing, catch, and gear will remain subject to any applicable State requirements. If a requirement of this part differs from a management measure required by a State that does not require cage tagging, any vessel owner or operator permitted to fish in the EEZ must comply with the more restrictive requirement while fishing in state waters. However, surrender of a Federal vessel permit pursuant to §652.4(n) allows an individual to comply with a less restrictive state minimum size requirement so long as fishing is conducted exclusively within state waters.

(b) *Eligibility*. Any vessel of the United States is eligible for a fishing vessel permit.

(c) *Application*.

(1) The owner or operator must submit a fishing vessel permit application on an appropriate form obtained from the Regional Director at least 45 days before the date the applicant desires to have the permit be effective. The application will contain at least the following information:

(i) Names, mailing addresses, and telephone numbers of the owner and operator or, if the owner is a corporation, the responsible corporate officer;

(ii) The name of the vessel;

(iii) The vessel's U.S. Coast Guard documentation number or State license number;

(iv) Engine and pump horsepower;

(v) Home port of the vessel;

(vi) Directed fishery or fisheries;

(vii) Fish hold capacity (in cages or bushels);

(viii) Dredge size and number of dredges;

(ix) Signature of the owner; and

(x) Any other information that may be necessary for the issuance or administration of the permit.

(2) Upon receipt of an incomplete or improperly executed application, the Regional Director will notify the applicant of such deficiency. If the applicant fails to correct

the deficiency within 15 days following the date of notification, the application will be considered abandoned.

(d) *Issuance*. Except as provided in Subpart D of 15 CFR Part 904, the Regional Director will issue a fishing vessel permit to each vessel for which an application is submitted only if the vessel owner has submitted all required logbooks.

(e) *Transfer*. A fishing vessel permit is valid only for the vessel for which it is issued.

(f) *Display*. The fishing vessel permit must be carried, at all times, on board the vessel for which it is issued, and must be maintained in legible condition. The permit shall be subject to inspection upon request by any authorized official.

(g) *Alteration*. Any permit that is altered, erased, or mutilated is invalid.

(h) *Replacement*. The Regional Director may issue replacement permits. An application for a replacement permit shall not be considered a new application.

(i) *Expiration*. A fishing vessel permit will expire on December 31 of each year.

(j) *Fees*. The Regional Director may, after publication of a notice in the Federal Register, charge a permit fee to recover administrative expenses.

(k) *Duration*. A permit is valid until it expires or is revoked, suspended, or modified under 15 CFR Part 904.

(l) *Change in application information*. Within 15 days after a change in the information contained in an application submitted under this section, the person issued the permit must report the change in writing to the Regional Director. The permit is void if a change in information is not reported.

(m) *Sanctions*. Procedures governing fishing vessel permit sanctions and denials are found at Subpart D of 15 CFR Part 904.

(n) *Surrender*.

(1) A permit issued for a vessel may be surrendered by the owner thereof by certified mail addressed to the Regional Director.

(2) The Regional Director will reissue a permit that has been surrendered within 45 days from the date the reissuance was requested.

§652.5 Processor/dealer permits.

(a) *General*. Any processor or dealer of surf clams or ocean quahogs must have a permit issued under this section maintained at his/her principal place of business.

(b) *Application*.

(1) An applicant must apply for a Processor/Dealer permit in writing to the Regional Director. The application must be signed by the applicant and submitted to the Regional Director at least 30 days before the date upon which the applicant desires to have the permit made effective. Applications must contain the name, principal place of business, mailing address and telephone number of the applicant.

(2) The Regional Director will notify the applicant of any deficiency in the application. If the applicant fails to correct the deficiency within 15 days following the date of notification, the application will be considered abandoned.

(c) *Issuance*. Except as provided in Subpart D of 15 CFR Part 904, the Regional Director will issue a permit within 30 days of the receipt of a completed application.

(d) *Expiration*. A permit expires on December 31 of each year or if the ownership of the dealer or processor changes.

(e) *Duration*. Any permit issued under this section remains valid until it expires, is suspended, revoked or ownership changes.

(f) *Alteration*. Any permit which is altered, erased, or mutilated is invalid.

(g) *Replacement*. The Regional Director may issue replacement permits. An application for a replacement permit shall be considered a new application.

(h) *Transfer*. A permit issued under this section is not transferable or assignable. It is valid only for the person to whom it is issued.

(i) *Inspection*. The person to whom a permit is issued under this section must maintain it at his/her principal place of business. The permit must be displayed for inspection upon request by an authorized officer or any employee of NMFS designated by the Regional Director.

(j) *Sanctions*. Procedures governing permit sanctions or denials are found at Subpart D of 15 CFR Part 904.

(k) *Fees*. The Regional Director may, after publication in the Federal Register, charge a permit fee.

(l) *Change in application information.* Within 15 days after a change in the information contained in an application submitted under this section, the person issued the permit must report the change in writing to the Regional Director. A permit is void if a change in information is not reported.

§652.6 Recordkeeping and reporting.

(a) *Processors and dealers.*

(1) *Processors - Weekly report.* Processors shall provide at least the following information to the Regional Director on a weekly basis, on forms supplied by the Regional Director:

(i) Date of purchase or receipt;

(ii) Name, permit number, and mailing address;

(iii) Number of bushels by species;

(iv) Cage tag numbers;

(v) Allocation permit number;

(vi) Vessel name and permit number;

(vii) Price per bushel by species;

(viii) Size distribution; and

(ix) Meat yield per bushel by species.

(2) *Dealers - Weekly report.* Dealers shall provide at least the following information to the Regional Director on a weekly basis, on forms provided by the Regional Director:

(i) Date of purchase or receipt;

(ii) Permit number and address;

(iii) Number of bushels by species;

(iv) Cage tag numbers;

(v) Allocation permit number;

(vi) Vessel name and permit number;

(vii) Price per bushel by species; and

(viii) Disposition of surf clams or ocean quahogs including name and permit number of recipient.

(3) *Annual report*. All persons required to submit reports under paragraph (a)(1) of this section shall also provide the following information to the Regional Director on an annual basis, on forms supplied by the Regional Director:

(i) Average number of processing plant employees during each month of the year just ended;

(ii) Average number of employees engaged in production of processed surf clam and ocean quahog products, by species, during each month of the year just ended;

(iii) Plant capacity to process surf clam and ocean quahog shellstock, or to process surf clam and ocean quahog meats into finished products, by species;

(iv) An estimate, for the next year, of the capacities described in paragraph (a)(3)(iii) of this section; and

(v) Total payroll for surf clam and ocean quahog processing, by month.

If the capacities described in paragraph (a)(3)(iii) of this section change more than ten percent during any year, the processor shall promptly notify the Regional Director.

(4) *Inspection*. A dealer or processor shall make the reports required by this paragraph available for inspection upon the request of an authorized officer or by an employee of NMFS designated by the Regional Director.

(5) *Record retention*. For one year from the date of entry on a record required by this paragraph, a dealer or processor shall keep each record at his/her principal place of business.

(b) *Vessel Owners and operators.*

(1) *Daily fishing log*. The owner or operator of any vessel conducting any fishing operations, except those conducted exclusively in waters of a state that requires cage tags or when he/she has surrendered the Federal fishing vessel permit, shall maintain, on board the vessel, an accurate daily fishing log for each fishing trip, on forms supplied by the Regional Director, showing at least:

(i) Name and permit number of the vessel;

(ii) Total amount in bushels of each species taken;

(iii) Date(s) caught;

(iv) Time at sea;

(v) Duration of fishing time;

(vi) Locality fished;

(vii) Crew size;

(viii) Crew share by percentage;

(ix) Landing port;

(x) Date sold;

(xi) Price per bushel;

(xii) Buyer;

(xiii) Tag numbers from cages used;

(xiv) Quantity of surf clams or ocean quahogs discarded; and

(xv) Allocation permit number.

(2) *When to fill in log.* Owners or operators shall fill in the daily fishing log before landing any surf clams or ocean quahogs.

(3) *Inspection*. The owner or operator shall make the logbook available for inspection upon the request of an authorized officer, or an employee of the NMFS designated by the Regional Director to make such inspections.

(4) *Record retention*. For one year after the date of the last entry in the log, each owner or operator shall keep each logbook at his/her principal place of business.

(5) *Weekly reports.* The owner or operator shall submit weekly reports (from the daily fishing logs) to the Regional Director, on forms supplied by the Regional Director. If no fishing trip is made during a week, a report so stating must be submitted.

§652.7 Vessel identification.

(a) *Official number.* The operator of each fishing vessel 25 feet (7.62 m) in length or longer subject to these regulations shall display its official number on the port and starboard sides of the deckhouse or hull, and on an appropriate weather deck so as to be visible from enforcement vessels and aircraft. Vessels under 25 (7.62 m) feet in length do not need to display any number. The official number is the documentation number issued by the U.S. Coast Guard or the certificate of registration issued by a State or the U.S. Coast Guard for undocumented vessels.

(b) *Markings*. Such markings must be at least eighteen (18) inches (45.7 cm) in height for fishing vessels over 65 feet (19.81 m) in length, and at least ten (10) inches (25.4 cm) in height for all other vessels over 25 feet (7.62 m) in length. The official number must be permanently affixed to or painted on the vessel and must be block Arabic numerals of a color that contrasts with the background.

(c) *Duties of the operator*. The operator of each vessel shall:

(1) Keep the required identifying markings clearly legible and in good repair; and

(2) Ensure that no part of the vessel, its rigging, or its fishing gear obstructs the view of the markings from an enforcement vessel or aircraft.

(d) *New Jersey vessels.* Instead of complying with paragraphs (a) and (b) of this section, vessels licensed under New Jersey law may use the appropriate vessel identification markings established by that State.

§652.8 Prohibitions.

(a) In addition to the general prohibitions specified in 50 CFR Part 620, it is unlawful for any person owning or operating a vessel issued a permit under §652.4 to land or possess any surf clams that do not meet the minimum sizes specified in §652.22, except when fishing exclusively within state waters as provided in §652.4(a)(2).

(b) It is unlawful for any person owning or operating a vessel issued a permit under §652.4, or issued an allocation permit under §652.20, to do any of the following:

(1) Land or possess any surf clams or ocean quahogs in excess of an individual allocation; or

(2) Transfer any surf clams or ocean quahogs to any person for a commercial purpose other than transport, unless that person has a permit issued under §652.5.

(c) It is unlawful for any person to do any of the following:

(1) Fish for surf clams or ocean quahogs in the EEZ during closed seasons;

(2) Fish for surf clams or ocean quahogs in the areas closed under §652.23;

(3) Use a vessel of the United States for taking, catching, harvesting, or landing any surf clams or ocean quahogs taken from the EEZ unless the vessel has a valid permit required under this part and the permit is aboard the vessel and has not been surrendered, revoked, or suspended;

(4) Offload, or cause to be offloaded, or sell or buy any surf clams or ocean quahogs whether on land or at sea as an owner, operator, dealer, processor, buyer,

or receiver in the surf clam or ocean quahog fishery, without preparing and submitting the documents required by §652.6;

(5) Alter, erase or mutilate any permit issued under §§652.4, 652.5, or 652.20;

(6) Alter, erase, mutilate, duplicate or cause to be duplicated, or steal any cage tag issued under §652.12;

(7) Produce, or cause to be produced, cage tags required under §652.12 without written authorization of the Regional Director;

(8) Tag a cage with a tag that has been rendered null and void or with a tag that has been previously used;

(9) Tag a cage of surf clams with an ocean quahog cage tag or tag a cage of ocean quahogs with a surf clam cage tag;

(10) Possess surf clams taken in violation of the size limits prescribed in §652.22, unless taken consistently with §652.4(a)(2);

(11) Possess an empty cage to which a cage tag required by §652.12 is affixed or possess any cage that does not contain surf clams or ocean quahogs and to which a cage tag required by §652.12 is affixed;

(12) Land or possess after offloading any cage holding surf clams or ocean quahogs without a cage tag or tags required by §652.12, unless the person can demonstrate the inapplicability of the presumption therein;

(13) Fail to submit or maintain information, or submit or maintain false information in records and reports required to be kept or filed under §652.6;

(14) Sell null and void tags;

(15) Shuck surf clams or ocean quahogs at sea unless permitted by the Regional Director under the terms of §652.24;

(16) Receive for a commercial purpose other than transport surf clams or ocean quahogs landed under an allocation under §652.20 without a permit issued under §652.5;

(17) Land unshucked surf clams or ocean quahogs in containers other than cages from vessels capable of carrying cages;

(18) Offload unshucked surf clams or ocean quahogs from vessels not capable of carrying cages other than directly into cages;

(19) Fish for surf clams or ocean quahogs in the EEZ without giving prior

notification or fail to comply with any of the notification requirements specified in §652.9;

(20) Fish for, retain, or land surf clams and ocean quahogs in or from the EEZ on the same trip;

(21) Fish for, retain, or land ocean quahogs in or from the EEZ on a trip designated as a surf clam fishing trip under §652.9(a)(4), or fish for , retain, or land surf clams in or from the EEZ on a trip designated as an ocean quahog fishing trip under §652.9(a)(4); or

(22) Fail to offload any surf clams or ocean quahogs harvested in the EEZ from a trip discontinued pursuant to §652.9 prior to commencing fishing operations in waters under the jurisdiction of any State.

(23) Violate any other provision of the Act, these regulations, or any applicable permit issued under §§652.4, 652.5 or 652.02.

(d) Possession of surf clams or ocean quahogs on the deck of any fishing vessel in closed areas, or the presence of any part of a vessel's gear in the water in closed areas, or the presence of any part of a vessel's gear in the water more than 12 hours after an announcement closing the entire fishery becomes effective shall be prima facie evidence that such vessel was fishing in violation of the provisions of the Magnuson Act and the regulations.

§652.9 Facilitation of enforcement.

(a) *Notification requirements*. Vessel owners or operators are required to provide the following information accurately prior to the departure of their vessel from the dock to fish for surf clams or ocean quahogs in the EEZ:

(1) The name of the vessel;

(2) The NMFS permit number assigned to the vessel;

(3) The expected date and time of departure from port;

(4) Whether the trip will be directed on surf clams or ocean quahogs;

(5) The expected date, time and location of landing; and

(6) The name of the individual providing notice.

(b) Vessel owners or operators are required to call the Office of Law Enforcement nearest to the point of offloading at the following locations to provide the information required above:

Rockland, ME - (207) 594-7742
Otis AFB, MA - (508) 563-5721
Wakefield, RI (401) 789-8022
Brielle, NJ - (908) 528-3315
Marmora, NJ - (609) 390-8303
Salisbury, Md - (301) 749-3545
Newport News, VA - (804) 441-6760

(c) All landings of surf clams or ocean quahogs from a trip for which notification was provided under this section are deemed to have been harvested in the EEZ and will count against the annual individual allocation.

(d) Owners or operators that have given notification of a fishing trip under this section who decide to cancel or postpone the trip prior to departure must immediately provide notice of cancellation by telephone to the Office of Law Enforcement to which the original notification was provided. A separate notification shall be provided for the next fishing trip. Owners or operators that discontinue a fishing trip in the EEZ must immediately provide notice of discontinuance by telephone to the Office of Law Enforcement to which the original notification was provided. The owner or operator providing notice of discontinuance shall advise of any changes in landing time or port of landing. The owner or operator discontinuing a fishing trip in the EEZ must return to port and offload any surf clams or ocean quahogs prior to commencing fishing operations in the waters under the jurisdiction of any state.

(e) The vessel permits, the vessel, its gear, and catch shall be subject to inspection upon request by any authorized officer.

(f) Also see §620.8 of this chapter.

§652.10 Penalties.

See §620.9 of this chapter.

§652.11 Foreign fishing.

Fishing for surf clams or ocean quahogs in the EEZ by any vessel other than a vessel of the United States is prohibited.

§652.12 Cage identification.

(a) *Tagging*. Before offloading, all cages that contain surf clams or ocean quahogs must be tagged with tags acquired annually under paragraph (b) of this section. A tag must be fixed on or as near as possible to the upper crossbar of the cage for every 60 cubic feet (1,700 L), or portion thereof, of the cage. A tag or tags must not be removed until the cage is emptied by the processor, at which time the processor must promptly remove and retain the tag(s) for collection or disposal as specified by the Regional Director.

(b) *Acquisition*. The Regional Director will issue a supply of tags to each individual vessel owner qualifying for an allocation under §652.20 prior to the beginning of each fishing year or he may specify, in the Federal Register, a vendor from whom the tags shall be purchased. The number of tags will be based on the owner's allocation. Each tag represents 32 bushels (1,700 L) of allocation.

(c) *Expiration*. Tags will expire at the end of the fishing year for which they are issued or if rendered null and void in accordance with 15 CFR part 904.

(d) *Return*. Tags that have been rendered null and void must be returned to the Regional Director.

(e) *Loss*. Loss or theft of tags must be reported by the owner numerically identifying the tags to the Regional Director by telephone as soon as the loss or theft is discovered and in writing within twenty four hours. Thereafter, the reported tags shall no longer be valid for use under this part.

(f) *Replacement*. Lost or stolen tags may be replaced by the Regional Director if proper notice of the loss is provided by the person to whom the tags were issued. Replacement tags may be purchased from the Regional Director or a vendor with a written authorization from the Regional Director.

(g) *Transfer*. See §652.20(f)(2).

(h) *Presumptions*. Surf clams or ocean quahogs found in cages without a valid state tag are deemed to have been harvested in the EEZ, and are part of an individual's allocation. This shall not apply if the individual can demonstrate that he/she has surrendered his/her Federal vessel permit issued under §652.4 and conducted fishing operations exclusively within waters under the jurisdiction of any state. Surf clams or ocean quahogs in cages with a Federal tag or tags, issued and still valid pursuant to this section, affixed thereto are deemed to have been harvested by the individual allocation holder to whom the tags were issued or transferred under §652.20(f).

Subpart B - Management Measures

§652.20 Annual individual allocations.

(a) *Allocation permits*. The Regional Director shall initially divide the quotas specified under §652.21 by individual allocations among the owners of vessels having reported landings of surf clams or ocean quahogs between January 1, 1979, and December 31, 1988. Initial allocations shall be made, by species, in the form of an allocation permit issued to the vessel owner specifying the total number of bushels he/she is entitled to harvest, together with cage tags issued pursuant to §652.12, based on the allocation percentage calculated in paragraph (b) of this section. Allocations in subsequent years shall be made by applying the allocation percentages to the annual quotas specified pursuant to §652.21. These allocations shall be issued in the form of an allocation permit. The total number of bushels of allocation shall be divided by 32 to determine the

appropriate number of cage tags to be issued or acquired under §652.12. Amounts of allocation greater than 0.5 created by this division are rounded upward to allow an allocation to be specified in whole cages.

(1) *Issuance*. Except as provided in subpart D of 15 CFR part 904, the Regional Director shall issue annual allocation permits on or before December 15th to the registered holders of an allocation as of November 1st. The annual allocation permit shall specify the allocation percentage and allocation of surf clams and/or ocean quahogs in bushels, by species, which the allocation holder is authorized to harvest.

(2) *Duration*. An annual allocation permit is valid until December 31st unless it is suspended, modified, or revoked under 15 CFR part 904, or revised due to a transfer of all or part of the allocation percentage under paragraph (f) of this section.

(3) *Alteration*. An annual allocation permit that is altered, erased, or mutilated is invalid.

(4) *Replacement*. The Regional Director may issue a replacement permit upon written application of the annual permit holder.

(5) *Transfer*. The annual allocation permit is valid only for the person to whom it is issued. All or part of the allocation specified in the allocation permit may be transferred in accordance with paragraph (f) of this section.

(6) *Fees*. The Regional Director shall, after publication in the Federal Register, charge a permit fee before issuance of the permit to recover administrative expenses. Failure to pay the fee will preclude issuance of the permit.

(b) *Initial allocation formulas.* Individual allocations of surf clams and ocean quahogs shall be calculated as percentages of the annual quotas (to six digits to the right of the decimal point) based on the following formulas:

(1) *Surf clams.*

(i) *Moratorium vessels.* For owners of vessels with permits to fish for surf clams in any Area (that is, vessels with permits issued pursuant to the moratorium), the initial surf clam allocation percentage shall be based on the following formula:

(A) *Historical Performance Component.*

(1) The surf clam catch (in bushels) that each permitted vessel caught (based on logbook reports) for calendar years 1979, 1980, 1981, 1982, 1983, 1984, 1985 (counted twice), 1986 (counted twice), 1987 (counted twice), and 1988 (counted

twice) shall be determined. This results in a total history of 14 data years for each vessel. Vessels that have had moratorium permits transferred to them will be credited with the surf clam catch history of the retired vessel(s).

(2) The two years with the vessel's lowest landings will be deleted from each vessel's history, leaving a total of 12 data years in each vessel's history.

(3) The 12-year history of each vessel is summed to a fleet total.

(4) The historical performance of each vessel relative to the entire fleet is calculated by dividing the individual history totals by the total for the fleet resulting in the historical ratio.

(B) *Vessel Size Component.*

(1) A cubic factor for each vessel shall be calculated from its physical dimensions (vessel length X width X depth).

(2) The cubic factor for each vessel shall be summed for a fleet total.

(3) The relative size of each vessel to the total dimensions of the entire fleet is calculated by dividing each cubic factor by the total for the fleet resulting in the cubic ratio.

(C) *80/20 Composite Ratio*. A ratio for each vessel for which the vessel's historical performance contributes 80 percent and the vessel's physical size contributes 20 percent is obtained as follows: (0.8 § historical ratio) + (0.2 § cubic ratio).

(ii) *New England Vessels*. For owners of vessels with permits to fish for surf clams in only the New England Area, the initial surf clam allocation percentage shall be based on a formula consisting of the following steps:

(A) The surf clam catch (in bushels) that each permitted vessel caught (based on logbook reports) for those years the vessel actually reported landings for calendar years 1979 through 1988 shall be determined.

(B) The year with the lowest catch is deleted for those vessels with more than one landing year.

(C) The average annual catch for each vessel shall be calculated by summing the available data years and dividing by the number of years.

(D) A ratio shall be calculated for each vessel by dividing each vessel's average catch by the annual quota of 3,150,000 bushels.

(E) These vessel ratios shall be expressed in the form of percentages of the annual quota.

(iii) *Final Allocation Ratios*. Assigning final allocation percentages to all surf clam vessels requires that the, heretofore, independent calculations made for moratorium and New England vessels be merged. This shall be accomplished by adjusting the composite 80/20 ratios calculated for moratorium vessels to account for the portion of the quota assigned to New England vessels as follows:

(A) The ratios calculated for New England vessels are summed into a "total New England ratio." This number is subtracted from 1.0 to generate an "adjustment factor" to be applied to moratorium vessel ratios.

(B) Each of the 80/20 composite ratios for moratorium vessels is multiplied by the "adjustment factor" giving a sum total of 1.0 when the ratios for the moratorium and New England vessels are combined.

(C) These vessel ratios shall be expressed in the form of percentages of the annual quota.

(iv) The percentages, calculated under paragraphs (b)(1)(i), (ii), and (iii) as modified by transfers under paragraph (f), shall be applied to each year's annual quota to calculate each vessel owner's annual allocation.

(2) *Ocean quahogs*. For owners of vessels with permits to fish for Mid-Atlantic surf clams and ocean quahogs or with permits to fish for ocean quahogs; the initial ocean quahog allocation percentage shall be based on the following formula:

(i) The ocean quahog catch (in bushels) that each permitted vessel caught (based on logbook reports) for those years the vessel actually reported landings for calendar years 1979 through 1988 shall be determined, with the year with the lowest catch deleted for those vessels with more than one landing year;

(ii) Vessels that have had moratorium permits transferred to them shall be credited with the ocean quahog catch history of the retired vessel(s);

(iii) The average annual catch for each vessel is then calculated by summing the available data years and dividing by the number of years. The average annual catches for each quahog vessel shall be summed to give a fleet total. Each vessel's ratio to this total shall be calculated by dividing each vessel's average catch by the fleet total;

(iv) These vessel ratios shall be expressed in the form of percentages of the annual quota; and

(v) The percentages, as modified by transfers under paragraph (f) of this section, shall be applied to each year's annual quota to calculate each vessel's annual allocation.

(c) *Notice of initial allocation.* After calculating the initial allocation in bushels, by species, to which each vessel owner is entitled, the Regional Director shall mail, by certified mail, such allocation to each eligible vessel owner. The Regional Director shall include the data and method that were used to calculate the allocation.

(d) *Appeal of initial allocation*. Initial individual allocations may be appealed to the Regional Director within 30 days of the receipt of the notice of allocation. Any such appeal must be in writing. Any appeal must be based on the grounds that the data used by the Regional Director are incorrect, or that a calculation is incorrect. Unfiled or revised weekly reports are inadmissible as evidence of error in calculating an allocation.

(1) The appeal may be presented, at the option of the appellant, at a hearing before an officer appointed by the Regional Director.

(2) The decision on the appeal by the Regional Director is the final decision of the Department of Commerce.

(e) *Final allocation permit.* Within two calendar quarters from the effective date of these regulations, the Regional Director shall issue final allocation permits. The percentage share of the annual quota represented by the final allocation shall remain the same each year unless all or part of the allocation is transferred.

(f) *Transfer*.

(1) *Allocation percentage*. Part or all of an allocation percentage may be transferred in amounts equivalent to not less than 160 bushels (8,500 L) (i.e., five cages) in the year in which the transfer is made, to any person eligible to own a documented vessel under the terms of 46 U.S.C. 12102(a). Such application for transfer by the allocation holder must be in writing on a transfer log supplied by the Regional Director. The application must be submitted to the Regional Director at least 10 days before the date on which the applicant desires the transfer to be effective. The application must include the new allocation holder's name and address, the exact amount of bushels to be transferred by species, the cage tags to be transferred by number, and any other information required by the transfer log. Applications for transfer may not be made between October 15th and December 31st of each year. The transfer is not effective until the new holder receives a new or revised annual allocation permit from the Regional Director.

(2) *Cage tags*. Cage tags issued pursuant to §652.12 may be transferred in quantities of not less than five tags at any one time subject to the restrictions and

procedure specified in paragraph (f)(1) above; provided that application for such cage tag transfers may be made at any time before December 10th of each year and the transfer is effective upon the receipt by the transferee of written authorization from the Regional Director.

(3) *Review*. The Regional Director shall review every application to transfer all or part of an allocation percentage or cage tags. If he determines that the applicant has been issued a Notice of Permit Sanction for a violation of the Magnuson Act that has not been resolved, he may decline to approve such transfer pending resolution of the matter.

(g) *Partial Year 1990*. In 1990, the percentage share of the final allocation (paragraph (e) of this section) will be applied only to the portion of the 1990 annual quota that remains, or is estimated to remain, unharvested at the time the final allocation permits go into effect.

§652.21 Catch quotas.

(a) *Surf clams:* The amount of surf clams that may be caught annually by fishing vessels subject to these regulations will be specified by the Secretary, on or about December 1, within the range of 1,850,000 bushels (98.5 Ml) and 3,400,000 bushels (181 Ml).

(1) *Establishing quotas*. Prior to the beginning of each year, the Council, following an opportunity for public comment, will recommend to the Secretary quotas and estimates of domestic annual harvest (DAH) and domestic annual processing (DAP) within the ranges specified. In selecting the quota the Council shall consider current stock assessments, catch reports, and other relevant information concerning:

(i) exploitable and spawning biomass relative to the optimum yield;

(ii) fishing mortality rates relative to the optimum yield;

(iii) magnitude of incoming recruitment;

(iv) projected effort and corresponding catches;

(v) geographical distribution of the catch relative to the geographical distribution of the resource; and

(vi) status of areas previously closed to surf clam fishing that are to be opened during the year and areas likely to be closed to fishing during the year.

The quota shall be set at that amount which is most consistent with the objectives of the Fishery Management Plan for the Atlantic Surf Clam and Ocean Quahog Fishery. The Secretary may set quotas at quantities different from the Council's

recommendations only if he can demonstrate that the Council's recommendations violate the national standards of the Magnuson Act and the objectives of the Atlantic Surf Clam and Ocean Quahog Fishery Management Plan.

(2) *Report*. Prior to the beginning of each year, the Regional Director shall prepare a written report, based on the latest available stock assessment report prepared by the NMFS, data reported by harvesters and processors according to these regulations, and other relevant data. The report will include consideration of:

(i) Exploitable biomass and spawning biomass relative to optimum yield;

(ii) Fishing mortality rates relative to optimum yield;

(iii) Magnitude of incoming recruitment;

(iv) Projected effort and corresponding catches;

(v) Status of areas previously closed to surf clam fishing that are to be opened during the year and areas likely to be closed to fishing during the year; and

(vi) Geographical distribution of the catch relative to the geographical distribution of the resource.

(3) *Public review*. Based on the information presented in the report, and in consultation with the Council, the Secretary shall propose an annual surf clam quota and an annual ocean quahog quota and shall publish them in the Federal Register. Comments on the proposed annual quotas may be submitted to the Regional Director within 30 days after publication. The Secretary shall consider all comments, determine the appropriate annual quotas, and publish the annual quotas in the Federal Register on or about December 1 of each year as provided for in §652.21(a).

(b) *Ocean quahogs*: The amount of ocean quahogs that may be caught by fishing vessels subject to these regulations shall be specified annually by the Secretary, on or about December 1, within the range of 4,000,000 bushels (213 Ml) to 6,000,000 bushels (319.4 Ml), following the procedures set forth in §652.21(a)(1), (2), and (3).

§652.22 Size restriction.

(a) *Minimum length*. A minimum size for surf clams is 4.75 inches (12.065 cm).

(1) *Suspension*. Upon the recommendation of the Mid-Atlantic Fishery Management Council, the Regional Director may suspend annually by publication in the Federal Register the minimum size unless discard, catch, and survey data indicate that 30 percent of the clams are smaller than 4.75 inches (12.065 cm) and the overall reduced size is not attributable to beds where growth of the individual clams has

been reduced because of density dependent factors.

(2) *Tolerance*.

(i) No more than 50 clams in any cage may be less than 4.75 inches (12.065 cm).

(ii) If any inspected cage of surf clams is found to be in violation of paragraph (a)(2)(i) of this section, all cages landed by the same vessel from the same trip are deemed to be in violation of the size limit.

(b) *Measurement*. Length is measured at the longest dimension of the surf clam.

§652.23 Closed areas.

(a) *Areas closed because of environmental degradation.* Certain areas are closed to all surf clam and ocean quahog fishing because of adverse environmental conditions. These areas will remain closed until the Secretary determines that the adverse environmental conditions have been corrected. If additional areas, due to the presence or introduction of hazardous materials or pollutants, are identified as being contaminated, they may be closed in accordance with paragraph (c) of this section. The areas currently closed are described as follows:

(1) *Boston Foul Ground.* A waste disposal site known as the "Boston Foul Ground" and located at 42°25′36" N. latitude and 70°35′00" W. longitude with a radius of one nautical mile in every direction from that point.

(2) *New York Bight*. A polluted area and waste disposal site known as the "New York Bight Closure" and located at 40°25′04" N. latitude and 73°42′38" W. longitude and with a radius of six nautical miles in every direction from that point, extending further northwestward, westward, and southwestward between a line from a point on the arc at 40°31′00" N. latitude and 73°43′38" W. longitude directly toward Atlantic Beach Light in New York to the limit of State territorial waters of New York; and a line from a point on the arc at 40°19′48" N. latitude and 73°45′42" W. longitude to a point at the limit of the State territorial waters of New Jersey at 40°14′00" N. latitude and 73°55′42" W. longitude.

(3) *106 Dumpsite*. A toxic industrial dump site known as the "106 Dumpsite" and located between 38°40′00" N. latitude and 39°00′00" N. latitude and between 72°00′00" W. longitude and 72°30′00" W. longitude.

(b) *Areas closed because of small surf clams*. Certain areas are closed because they contain small surf clams.

(1) *Closure*. The Secretary may close an area to surf clam and ocean quahog fishing if he determines, based on logbook entries, processors' reports, survey cruises, or other information, that the area contains surf clams of which:

(i) 60 percent or more are smaller than 4.5 inches (11.43 cm) in size; and

(ii) Not more than 15 percent are larger than 5.5 inches (13.97 cm) in size. (Sizes are measured at the longest dimension of the surf clam shall.)

(2) *Reopening*. The Secretary may reopen areas or parts of areas closed under paragraph (b)(1) of this section if he determines, based on survey cruises or other information, that:

(i) The average length of the dominant (in terms of weight) size class in the area to be reopened is equal to or greater than 4.75 inches (12.065 cm); or

(ii) The yield or rate of growth of the dominant size class in the area to be reopened would be significantly enhanced through selective, controlled or limited harvest of surf clams in the area.

(c) *Procedure*.

(1) The Regional Director may hold a public hearing on the proposed closure or reopening of any area under paragraph (a) or (b) of this section. The Secretary shall publish notice in the Federal Register of any proposed area closure or reopening, including any restrictions on harvest in a reopened area. Comments on the proposed closure or reopening may be submitted to the Regional Director within 30 days after publication. The Secretary shall consider all comments and publish the final notice of closure or reopening, and any restrictions on harvest, in the Federal Register. Any adjustment to harvest restrictions in a reopened area shall be made by Federal Register notice. The Regional Director shall send notice of any action under this paragraph to each surf clam or ocean quahog processor and to each surf clam or ocean quahog permit holder.

(2) If the Regional Director determines as the result of testing by state, Federal, or private entities that a closure of an area under paragraph (a) of this section is necessary to prevent any adverse affects fishing may have on the public health, he may close the area for 60 days, by publication of notice in the Federal Register, without prior comment or public hearing. If an extension of the 60 day closure period is necessary to protect the public health, the hearing and notice requirements of paragraph (c)(1) shall be followed.

§652.24 Shucking at sea.

(a) *Observers*.

(1) The Regional Director may allow the shucking of surf clams or ocean quahogs at sea if he determines that an observer carried aboard the vessel can measure accurately the total amount of surf clams and ocean quahogs harvested in the shell prior to shucking.

(2) Any vessel owner may apply in writing to the Regional Director to shuck surf clams or ocean quahogs at sea. The application shall specify:

(i) Name and address of the applicant;

(ii) Permit number of the vessel;

(iii) Method of calculating the amount of surf clams or ocean quahogs harvested in the shell;

(iv) Vessel dimensions and accommodations; and

(v) Length of fishing trip.

(3) The Regional Director shall provide an observer to any vessel owner whose application is approved. The owner shall pay all reasonable expenses of carrying the observer on board the vessel.

(4) Any observer shall certify at the end of each trip the amount of surf clams or ocean quahogs harvested in the shell by the vessel. Such certification shall be made by the observer's signature on the daily fishing log required by §652.6.

(b) *Conversion factor.*

(1) Based on the recommendation of the Council, the Regional Director may allow shucking at sea of surf clams or ocean quahogs, with or without an observer, if he determines a conversion factor for shucked meats to calculate accurately the amount of surf clams or ocean quahogs harvested in the shell.

(2) The Regional Director shall publish a notice in the Federal Register specifying a conversion factor together with the data used in its calculation for a 30 day comment period. After consideration of the public comments, and any other relevant data, the Regional Director may publish a final notice specifying the conversion factor.

(3) If the Regional Director makes the determination specified in paragraph (b)(1) of this section, he may authorize the vessel owner to shuck surf clams or ocean quahogs at sea. Such authorization shall be in writing and be carried aboard the vessel.

§652.26 Experimental fishery. The Regional Director may authorize experimental fishing for surf clams or ocean quahogs in order to gather information necessary for management. Such experimental fishing will not require an allocation permit.

APPENDIX 8. GLOSSARY OF TECHNICAL TERMS AND ACRONYMS

Act (MFCMA) - the Magnuson Fishery Conservation and Management Act of 1976, as amended, 16 USC 1801 *et seq.*

bushel (bu) - a standard unit of measure presumed to hold 1.88 cubic feet of surf clams or ocean quahogs in the shell (1 bu. of offshore surf clams = 17 lbs. of meats) (1 bu. of ocean quahogs = 10 lbs. of meats).

cage - a container with a standard unit of measure containing 60 cubic feet. The outside dimensions of a standard cage generally are 3' wide, 4' long and 5' high.

CFR - Code of Federal Regulations.

Council (MAFMC) - the Mid-Atlantic Fishery Management Council.

CPUE - catch per unit of effort.

Dealer - a person who receives surf clams and ocean quahogs for a commercial purpose other than transport on land and who does not remove them from the cage.

Fishing trip - a departure from port, transit to the fishing grounds, fishing, and returning to port.

Fishery Conservation Zone (FCZ) - the zone contiguous to the territorial sea of the US, the inner boundary of which is a line coterminous with the seaward boundary of each of the coastal States and the outer boundary of which is a line drawn in such a manner that each point on it is 200 nautical miles from the baseline from which the territorial sea is measured.

Georges Bank Area - that portion of the New England Area east of 69° W. longitude.

GRT - gross registered ton.

Mid-Atlantic Area - that portion of the FCZ south of the line that begins at 41°18'16.249" north latitude and 71°54'28.477" west longitude and proceeds S 37°22'32.75" E to the point of intersection with the outward boundary of the FCZ.

MSY - maximum sustainable yield. The largest average catch of yield that can continuously be taken from a stock under existing environmental conditions.

Nantucket Area - that portion of the New England Area west of 69° W. longitude.

natural mortality - deaths from all causes except fishing, including predation, senility, epidemics, pollution, etc.

NEFC - the Northeast Fisheries Center of the NMFS.

New England Area - that portion of the FCZ north of the line that begins at 41°18'16.249" north latitude and 71°54'28.477" west longitude and proceeds S 37°22'32.75" E to the point of intersection with the outward boundary of the FCZ.

NMFS - the National Marine Fisheries Service of the National Oceanic and Atmospheric Administration (NOAA).

Notification Area - an Area within which a vessel may not fish for surf clams prior to the vessel's owner or operator notifying the Regional Director pursuant to this FMP.

Off loading - to separate physically a cage from a vessel such as by the removal of the sling or wire used to remove the cage from the harvesting vessel.

OY - Optimum Yield.

Personal use - harvest of surf clams or ocean quahogs for use as bait, for human consumption, or for other purposes (not including sale or barter) in amounts not to exceed 2 bushels per person per trip.

Processor - a person who receives surf clams or ocean quahogs for a commercial purpose and removes them from a cage.

Regional Director (RD) - the Regional Director, Northeast Region, NMFS, One Blackburn Drive, Gloucester, MA 01930-2998. Telephone 508-281-9250.

stock assessment - the NMFS yearly biological assessment of the status of the resources. This document provides the official estimates of stock size, spawning stock size, fishing mortalities, recruitment, and other pa-

rameters used in this Plan. The data from these assessments shall constitute the "best scientific information currently available" as required by the Act.

Territorial Sea - marine waters from the shoreline to 3 miles seaward.

USDC - US Department of Commerce.

year class - the fish spawned or hatched in a given year.

yield per recruit (YPR) - the expected yield in weight from a single recruit.