

**AMENDMENT #3 TO THE FISHERY MANAGEMENT PLAN
FOR THE
SURF CLAM AND OCEAN QUAHOG FISHERIES
AND
SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT**

April 1981

**Mid-Atlantic Fishery Management Council
in cooperation with the
National Marine Fisheries Service
and the
New England Fishery Management Council**

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Abbreviations and Definitions Used In This Document

Act or **MFCMA** - The Magnuson Fishery Conservation and Management Act of 1976, as amended, 16 U.S.C. 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 standard unit of measure presumed to hold 32 bu. of surf clams or ocean quahogs in the shell. The outside dimensions of a standard cage generally are 3' wide, 4' long, and 5' high.

CFR - Code of Federal Regulations.

cm - centimeter.

Council - the Mid-Atlantic Fishery Management Council

cu - cubic.

FCZ - Fishery Conservation Zone - 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.

GRT - gross registered ton.

in - inch.

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.

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 NOAA.

NOAA - the National Oceanic and Atmospheric Administration of the US Dept. of Commerce.

OY - Optimum Yield.

Regional Director - the Regional Director, Northeast Region, NMFS.

Secretary - the Secretary of Commerce.

II. SUMMARY

The original Fishery Management Plan for the Atlantic Surf Clam and Ocean Quahog Fisheries (Plan) was approved by the Secretary of Commerce in November, 1977, for the period through September 1979. Amendment #1 extended it through 31 December 1979, and revised reporting requirements to bring them in compliance with the amended Act. Amendment #2 extended it through the end of calendar year 1981. Amendment #3 extends the Plan indefinitely and revises it.

The objectives of the Plan are:

1. Rebuild the surf clam populations to allow eventual harvest approaching the 50 million pound level, which is the estimate of maximum sustainable yield over the range of the resource, based on the average yearly catch from 1960 to 1976.
2. Minimize economic dislocation to the extent possible consistent with objective 1 and encourage efficiency in the fishery.
3. Prevent the harvest of ocean quahogs from exceeding maximum sustainable yield and direct the fishery toward achieving Optimum Yield.
4. Provide the greatest degrees of freedom and flexibility to all harvesters of these resources consistent with the attainment of the other objectives of this Plan.
5. Optimize yield per recruit.
6. Increase understanding of the conditions of the stocks and fishery.

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

Alternatives for Amendment #3 are:

1. Take no action at this time.
2. Continue the provision to close areas with large numbers of small surf clams, impose a 5.5" surf clam size limit in both the Mid-Atlantic and New England Areas, continue annual and quarterly quotas, and continue the effort restrictions in the current Plan. The ocean quahog regime would be continued unchanged.
3. Remove effort restrictions.
4. Revise the fishing week, bad weather make-up day, and effort restrictions.
5. Institute a permit limitation system in the surf clam fishery.
6. Create two Mid-Atlantic surf clam management areas.
7. Create separate management areas for reopened surf clam areas.
8. Continue the provision to close areas with small surf clams, impose a 5.5" surf clam size limit, continue annual quotas, and institute a vessel allocation system in the surf clam fishery.
9. Continue the provision to close areas with large numbers of small surf clams and impose a 5.5" surf clam size limit. The ocean quahog regime would continue unchanged.

The alternatives adopted are 2, 4, 5a, and 7. This includes an indefinite extension of the Plan with annual and quarterly quotas for surf clams, an annual quota for ocean quahogs, and a 5.5" minimum size limit for surf clams in the Mid-Atlantic Area. The New England surf clam management area is continued. In the Mid-Atlantic Area, surf clam quarterly quotas are equal. The bad weather make-up days will be in effect during November through April. The fishing week begins at 6:00 am

Sunday and ends at 6:00 pm Thursday, but may begin at 12:00 am Sunday under certain conditions. Effort restrictions are set by the Regional Director so as to ensure fishing throughout a quarter with the minimum chance of closure while also minimizing the effort changes during the quarter. Areas closed for containing concentrations of small surf clams, when reopened, have allowable catches separate from the overall quota and appropriate effort restrictions will be imposed in such areas to insure that the harvest of the allowable catch extends throughout a predetermined time period. Fishermen are required to advise NMFS if they want to fish in a reopened area. Quotas and estimates of Domestic Annual Harvest and Domestic Annual Processing will be set annually through a consultative process. For surf clams the values are between 1.8 and 2.9 million bushels (approximately 30 - 50 million pounds of meats) for the Mid-Atlantic Area and between 25,000 and 100,00 bushels (approximately 425,000 - 1.7 million pounds of meats) in the New England Area. For ocean quahogs, the values are between 4.0 and 6.0 million bushels (40 - 60 million pounds of meats).

All vessels with valid permits issued pursuant to the moratorium on entry of new vessels into the surf clam fishery as of the beginning of 1982 will receive new permits under the permit limitation system. These vessels are required to harvest a minimum of 2,500 bushels of FCZ clams (i.e., FCZ surf clams and/or ocean quahogs) annually to receive a permit for the subsequent year. Permits of vessels that do not meet that criterion may be issued to new vessels at a ratio of 1 new vessel for every 4 permits not reissued. This process continues for a total of 5 years (i.e., 1982-1986). Beginning with the sixth year (1987) the total number of permits that may be issued in any year may not exceed the number of permits issued (outstanding) at the end of 1986. Beginning in 1987, a new permit may be issued for every permit not reissued because a permitted vessel did not meet the harvest criterion. This entry limitation program is conditioned by the provision that the Council must review the program and announce its findings during the fishing year immediately following the fishing year during which any of the following criteria occurs: (1) the annual quota reaches 50 million pounds, or (2) the then licensed vessels harvest less than 90% of the annual quota, or (3) two Plan years have lapsed since the implementation of the above limited entry program, and further that the limited entry program shall continue in force unless abolished or modified via Plan Amendment.

The alternatives are discussed in Section XII.

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IV. INTRODUCTION

IV-1. Development of the Plan

This Amendment was prepared by the Mid-Atlantic Fishery Management Council in cooperation with the New England Fishery Management Council. It contains management measures to regulate fishing for surf clams and ocean quahogs and a Supplemental Environmental Impact Statement.

This Amendment, once approved and implemented by the Secretary of Commerce, will amend regulations on harvesting surf clams and ocean quahogs within the FCZ that were established by the Plan currently in effect.

IV-2. Overall Management Objectives

The objectives of the original Plan were:

1. Rebuild the declining surf clam populations to allow eventual harvest approaching the 50 million pound level, which is the present best estimate of the maximum sustainable yield, based on the average yearly catch from 1960 to 1976.
2. Minimize short-term economic dislocations to the extent possible consistent with objective 1.
3. Prevent the harvest of ocean quahogs from exceeding maximum sustainable yield and direct the fishery toward maintaining Optimum Yield.

The Council has reviewed these objectives in light of changing conditions in the fishery and has revised them slightly and added three additional objectives. The surf clam stock apparently is rebuilding. The ocean quahog fishery is developing. The issue for Amendment #3 (and the future) is the continuation of the fishery at levels consistent with long-term stock conservation.

The revised objectives are:

1. Rebuild the surf clam populations to allow eventual harvest approaching the 50 million pound level, which is the estimate of maximum sustainable yield over the range of the resource, based on the average yearly catch from 1960 to 1976.
2. Minimize short-term economic dislocations to the extent possible consistent with objective 1.
3. Prevent the harvest of ocean quahogs from exceeding maximum sustainable yield and direct the fishery toward achieving Optimum Yield.
4. Provide the greatest degrees of freedom and flexibility to all harvesters of these resources consistent with the attainment of the other objectives of this Plan.
5. Optimize yield per recruit.
6. Increase understanding of the conditions of the stocks and fishery.

The management unit continues unchanged, and is all surf clams (Spisula solidissima) and all ocean quahogs (Arctica islandica) in the Atlantic FCZ.

Management of the resources is currently based on Amendment #2 to the Plan, which extends through calendar year 1981 and contains the following measures:

1. There are two management areas for the surf clam fishery: the New England Area and the Mid-Atlantic Area. The dividing line between the areas is the dividing line between the New England and Mid-Atlantic Fishery Management Councils. The dividing line begins at the intersection point of Connecticut, Rhode Island, and New York at 41°18'16.249" latitude and 71°54'28.477" longitude and proceeds S 37°22'32.75" E to the point of intersection with the outward boundary of the FCZ (50 CFR 601.12(a), Federal Register 42(137), 18 July 1977, page 36980).

2. For the Mid-Atlantic Area, Optimum Yield, Domestic Annual Harvest, Domestic Annual Processing, and quota for surf clams for 1980 and 1981 are 1.8 million bushels. For the New England Area, Optimum Yield, Domestic Annual Harvest, Domestic Annual Processing, and quota for 1980 and 1981 are 25,000 bushels. In the Mid-Atlantic Area the annual surf clam quota is divided into quarterly quotas of 400,000 bushels for October through December and January through March, and 500,000 bushels for April through June and July through September. The Regional Director regulates fishing times so that the quarterly quotas may be harvested with the minimum chance of a closure.

While Domestic Annual Processing is discussed separately for the New England and Mid-Atlantic Areas, the separate management areas do not apply to the processing sector.

The ocean quahog Optimum Yield, Domestic Annual Harvest, Domestic Annual Processing, and quota are 3.5 million bushels for 1980 and 4.0 million bushels for 1981, respectively.

3. In the surf clam fishery there is a fishing week of no more than four days, Monday through Thursday. To help spread the quarterly catch evenly throughout the quarter, each vessel is restricted to 24 hours of fishing per week at the beginning of each quarter. If the Regional Director determines that the quarterly quota will not be harvested, the weekly hours may be increased. The Regional Director may prohibit fishing if it is likely that the quarterly quota will be exceeded. Vessels are required to stop fishing at 5:00 pm with the fishing week 5:00 pm Sunday - 5:00 pm Thursday. During the months of December, January, February, and March, a make-up day for bad weather is permitted on the fishing day following the fishing day lost to bad weather.

In the New England Area, there are no effort restrictions unless and until half of the 25,000 bushel quota is harvested, at which time the effort restrictions operating in the Mid-Atlantic Area are imposed by regulation.

4. Fishing for ocean quahogs is permitted 24 hours per day, 7 days per week. NMFS may, by regulation, restrict ocean quahog fishing if it is expected that the annual quota will be reached in order to minimize the chances of closure of the fishery.
5. Entry of additional vessels into the surf clam fishery in the Mid-Atlantic Area is prohibited. There is no moratorium in the New England Area. Vessels with permits issued pursuant to the moratorium in both New England and the Mid-Atlantic may fish in both areas on both quotas. Vessels entering the fishery that do not meet the moratorium conditions may not fish south of the dividing line. The moratorium does not preclude replacement of vessels involuntarily leaving the fishery during the time when the moratorium is in effect.
6. Surf clam beds may be closed to fishing if over 60% of the clams are under 4.5" in length and less than 15% are over 5.5" in length.
7. All vessels in the FCZ surf clam and ocean quahog fisheries must be licensed. Fishermen and processors in both fisheries must submit reports to NMFS.

V. DESCRIPTION OF THE STOCKS

V-1. Introduction

The following sections are based on the most recent biological assessments by the Northeast Fisheries Center of the surf clam and ocean quahog resources.^{1,2} Section V-2 contains excerpts from the surf clam assessment and the entire ocean quahog assessment. This material supplements and updates the presentations given in Section IV of the original (1977) Surf Clam and Ocean Quahog Fishery Management Plan and in Section V of Amendment #2.

V-2. Abundance, Present Condition, and Estimate of Maximum Sustainable Yield

No new information is available with which to update the estimate of maximum sustainable yield for surf

1. F.M. Serchuk and S.A. Murawski. 1980a. NMFS, NEFC, Woods Hole Lab. Ref. Doc. No. 80-33.
2. F.M. Serchuk and S.A. Murawski. 1980b. NMFS, NEFC, Woods Hole Lab. Ref. Doc. No. 80-32: 6 p.

clams, which was estimated in the original Plan to be 2.9 million bushels (approximately 50 million pounds of meats) over the range of the resource. The discussion below summarizes the most recent assessment of the status of the surf clam populations.

Large-scale harvesting of ocean quahogs did not begin until 1977, and the abundance and present status of ocean quahogs are essentially unchanged from virgin stock conditions. Data from the most recent NMFS survey and other research have, however, enabled a refinement of the estimate of maximum sustainable yield for ocean quahogs.

Surf Clams³

Results of assessment analyses indicate that commercial landings and fishing patterns were virtually identical in 1978 and 1979. Approximately 91-92% of the annual offshore landings (31.4 and 29.1 million pounds, respectively) were taken in the offshore Delmarva waters (i.e., the FCZ off the States of Delaware, Maryland, and Virginia). Tonnage Class 3 vessels (greater than 100 GRT) accounted for greater than 70% of the total offshore surf clam catch during both years.

Commercial catch-per-effort indices (bushels/hour fished) increased during 1979 for all vessel classes in Northern New Jersey and for Class 1 and 3 in Southern New Jersey. In Delmarva, the overall 1979 commercial abundance indices were similar to those from 1978, except for the Class 3 index which slightly increased. On face value, these data would suggest relative resource stability in Delmarva and improved resource abundance in Northern and Southern New Jersey. The 1979 commercial catch/effort data, however, overestimate relative abundance to the extent that increased fishing power and/or increasing searching time for productive beds occurred relative to 1978. Double rigging (two dredges) of many Class 3 vessels transpired in 1979, as well as general increases in dredge sizes. No adjustments in the reported catch and effort statistics were made for these fishing power changes since proper weighting factors are not available. Hence, the 1979 commercial indices, particularly the Class 3 values, should be considered as liberal rather than conservative estimates of relative resource conditions within each of the offshore areas.

Stratified mean catch-per-tow indices from NMFS shellfish assessment surveys in December 1978 and January 1980 indicated recent increases in surf clam abundance in Northern New Jersey and in Delmarva. Pre-recruit indices and survey length-frequency data imply that these increases were due to a relatively strong 1976 year-class in Northern New Jersey and a strong 1977 year-class in Delmarva. Based on age and growth relationships derived from age samples from the December 1978 survey, these year-classes should recruit to the commercial fishery in 1981 and 1982, respectively, at about the size/age at first capture of maximum yield per recruit.

The January 1980 pre-recruit index in Northern New Jersey was the second highest ever observed, and the total number per tow index was within the range of relatively high values noted in the late 1960s. Both of the 1980 commercial-sized relative abundance indices (number and weight) were the highest since 1976, and were 4.5 and 3.6 fold greater, respectively, than the December 1978 survey values. Total biomass (meat weight) per tow in 1980 resultingly increased to the highest level in four years.

Total number per tow indices of Delmarva surf clams were relatively stable between 1965-1976, declining during 1977, and have recently increased to record high levels. The 1980 total and pre-recruit indices were the second highest in the survey time series, exceeded only by the December 1978 values. Differences between the December 1978 and 1980 indices should be considered more apparent than real. Both surveys similarly indicated a wide-spread distribution of small clams and hence the indices reflect improved abundance rather than an increase and subsequent decline in population size. Unlike the Northern New Jersey population, in which a successful 1976 year-class appears dominant, the Delmarva resource has produced a strong 1977 year-class. In both areas, the respective dominant year-classes are of approximately equal strength as evidenced by similar pre-recruit indices at age 3. The 1980 Delmarva commercial-size number per tow and weight per tow indices were larger than they were during 1976-1978. Despite this recent improvement in the relative number and biomass of commercial-sized clams, the 1977-1980 commercial catch per tow indices are considerably lower than survey indices of commercial clams in Delmarva obtained during 1965-1976. These data suggest that landings from Delmarva since 1977 have reduced exploitable biomass.

3. The following discussion is taken from Serchuk and Murawski, 1980a.

In Southern New Jersey, the recent survey indices have been relatively stable. While the 1978 pre-recruit indices (January and December surveys) indicated recent modest recruitment success, the relative magnitude of this recruitment is very much less than in either the Northern New Jersey or Delmarva populations.

Ocean Quahogs⁴

Introduction

This report presents an updated evaluation of the status of ocean quahog, *Arctica islandica*, populations off the Middle Atlantic coast of the United States (Cape Cod to Cape Hatteras). Estimates of minimum population size and equilibrium yields from the Middle Atlantic resource, provided in Murawski and Serchuk (1979a), are re-examined relative to current commercial landings levels from the Middle Atlantic FCZ, and new information on ocean quahog growth rate and longevity (Jones, 1980; Murawski *et al.*, 1980; Thompson *et al.*, 1980).

Results and Discussion

Provisional 1979 Mid-Atlantic FCZ landings of ocean quahogs totaled 31.6 million pounds (meats), a 56% increase from the 1978 reported landings of 20.3 million pounds (Table 1). During both years, total annual FCZ landings were regulated by annual quotas of 3.0 million bushels (30 million pounds, meat weight), under a Fishery Management Plan for the Atlantic Surf Clam and Ocean Quahog Fisheries (FMP). FCZ landings accounted for 91% of the total 1979 USA commercial ocean quahog catch; in 1978, 88% of the total quahog catch was taken from the FCZ.

Based on areal expansion of average research vessel survey catch per tow data from seven cruises in offshore Mid-Atlantic waters during 1965-1977, Murawski and Serchuk (1979a, 1979b) estimated the total quahog biomass from Long Island through Delmarva to be approximately 1.5×10^6 metric tons (mt) of meat (3.3×10^9 pounds). Of this total, 46% was located off Long Island, 44% off New Jersey, and 10% off the Delmarva Peninsula (Table 2). Biomass estimates are minimum values to the extent that the survey dredge is (1) size selective, and (2) not 100% efficient in sampling fully vulnerable quahogs.

Given the estimated biomass of ocean quahogs in the Middle Atlantic FCZ, Murawski and Serchuk (1979a) derived equilibrium yields (i.e., maximum sustainable yields) using the model of Gulland (1971) for virgin or unexploited fishery stocks, viz.

$$C_{\max} = (0.5) (M) (B_0)$$

where C_{\max} = maximum sustainable yield

M = instantaneous natural mortality rate

B_0 = virgin biomass (1.5×10^6 mt, meats, for ocean quahogs).

Since FCZ fishery exploitation on ocean quahog was relatively minor prior to 1976, and survey relative abundance indices during 1965-1977 indicated little change on quahog populations over time, Murawski and Serchuk (1979a) believed Gulland's model was appropriate for calculating ocean quahog MSY values. The results of these calculations are presented in Table 3.

MSY was derived for a range of natural mortality rates (M) since empirical estimates of natural mortality were not available. Also, because dredge mortality to non-harvested quahogs was believed to be between 40 to 60% of the amount harvested (Mid-Atlantic Fishery Management Council, 1977), MSY values were calculated assuming 40%, 50%, and 60% biomass losses to yield from dredge mortality (Table 3).

The MSY estimates vary from 6.6 million pounds to 100 million pounds and primarily depend on the assumed natural mortality rate. 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) indicate that ocean quahogs are among the slowest-growing and longest-lived

4. Reprinted from Serchuk and Murawski, 1980b, *op. cit.*

marine organisms. Quahogs larger than 90 mm (3.5") shell length, common in NMFS survey catches in the Mid-Atlantic, are estimated to be 70 years or older. Since quahogs as large as 140 mm (5.5") have been taken in the NMFS surveys, quahog longevity must be well in excess of 100 years. Accordingly, the natural mortality rate must be exceedingly low. Based on the percent of quahogs larger than 100 mm in NMFS survey size-frequency distributions, natural mortality values (M) between 0.02 and 0.027 appear reasonable. MSY estimates for these values of M range from 13.3 to 27 million pounds (Table 3).

Annual FCZ ocean quahog landings during 1977-1979 averaged 22.7 million pounds, within the range of MSY values for M = 0.027. However, most of the landings were derived from New Jersey and Delmarva which account for 54% of the total calculated biomass from Long Island - Delmarva (Table 2). Hence, if the long-term areal exploitation pattern remains constant, MSY for the areas being fished is probably less than 15 million pounds (0.54 x 26.983; Table 3).

The Gulland model for estimating MSY assumes that maximum surplus production occurs when standing stock biomass is reduced to 50% of the virgin level. For Mid-Atlantic ocean quahog populations, this premise implies that stock levels could theoretically be reduced by 1.67 billion pounds before the population level producing MSY is achieved. If a more robust approach is taken and maximum surplus production is assumed to occur when stock biomass is reduced to 2/3 of the virgin level, then 1.1 billion pounds could be harvested before the MSY population size is attained. Cumulative landings during 1976-1979 comprise 2.2% of the estimated total Mid-Atlantic quahog standing stock biomass, and 4% of the standing stock levels in New Jersey and Delmarva. Accordingly, current harvest levels (1980-1981: 35-40 million pounds per annum) should not cause irreparable harm or significant adverse effects to the resource in the immediate future. If, however, subsequent evidence suggests rapid resource depletion and little concurrent recruitment to the population, appropriate constraints on the fishery may be necessary.

Table 1. Landings of Ocean Quahogs from State Waters (less than 3 miles) and the Fishery Conservation Zone (3-200 miles), 1967-1979 (thousands of pounds of meat)

<u>Year</u>	<u>State Waters</u>	<u>FCZ</u>	<u>Total</u>
1967	44	-	44
1968	225	-	225
1969	639	-	639
1970	1746	-	1746
1971	2030	-	2030
1972	1400	-	1400
1973	1457	-	1457
1974	805	-	805
1975	1254	-	1254
1976	1446	4089	5535
1977	2464	16085	18549
1978	2686	20279	22965
1979	3095	31629	34724

Table 2. Minimum Population Biomass Estimates of Ocean Quahogs from Long Island - Delmarva Derived from Areal Expansion of NEFC Research Vessel Survey Mean Catch per Tow Data Obtained During 1965-1977. The Percentage Distribution of Total Biomass, by Area, is Also Given. (From Murawski and Serchuk, 1979a: Table 5)

<u>Area</u>	<u>Minimum Biomass (Meat Weight)</u>		<u>Percentage of Total biomass Long Island - Delmarva</u>
	<u>Metric Tons</u>	<u>Millions of Pounds</u>	
Long Island	690,925	1,523	46
New Jersey	669,942	1,477	44
Delmarva	150,191	331	10
Total	1,511,058	3,331	100

Table 3. Calculation of Maximum Sustainable Yield (MSY) for Ocean Quahogs from Long Island - Delmarva
(M = instantaneous natural mortality rate, B₀ = biomass in meat weight available to the fishery, X = proportion of virgin stock size for MSY from Schaefer yield model, P = amount of additional biomass lost from dredge mortality of unharvested quahogs expressed as a proportion of amount caught) (weights in thousands of pounds)

M	B ₀	X	P	MSY
0.01 (a)	3,331,127	0.5	0.4	9,993
			0.5	8,329
			0.6	6,662
0.02 (b)	3,331,127	0.5	0.4	19,986
			0.5	16,655
			0.6	13,324
0.027 (c)	3,331,127	0.5	0.4	26,983
			0.5	22,486
			0.6	17,989
0.05 (d)	3,331,127	0.5	0.4	49,967
			0.5	41,639
			0.6	33,312
0.10 (e)	3,331,127	0.5	0.4	99,934
			0.5	83,279
			0.6	66,622

- a. Equivalent to 36.8% of the population living to 100 years.
- b. Equivalent to 13.5% of the population living to 100 years.
- c. Equivalent to 6.7% of the population living to 100 years.
- d. Equivalent to 0.7% of the population living to 100 years.
- e. Equivalent to less than 0.1% of the population living to 100 years.

V-3. Probable Future Condition

Surf Clams

Results of the most recent biological assessment indicate that surf clam biomass off both new Jersey and Delmarva is increasing significantly, due to strong 1976 and 1977 year-classes off Northern New Jersey and Delmarva, respectively. The 1976 year-class off New Jersey should begin to reach commercial size (i.e., the minimum size proposed by this Amendment) starting in late 1981 while the 1977 year-class off Delmarva should begin to reach that size beginning in 1982.

Data are not available with which to estimate total abundance or fishing mortality (F) rates. Stock assessment and commercial catch data, however, can be used to estimate a 'relative exploitation rate', which is an index which relates the magnitude of the commercial catch in an area (A) to the survey catch per tow index for that area (B), via the formula $A/B = C$, where C equals the relative exploitation rate. Commercial catches, abundance indices, and the resultant exploitation rates for the New Jersey and Delmarva areas for 1965-1980 are given in the stock assessment. Assuming that fishing mortality is proportionally related to this relative exploitation rate, the latter index can provide useful guidance in relating different levels of future catches to predicted resource abundance.

Since the Plan went into effect, the relative exploitation rate for the New Jersey area (Northern New Jersey and Southern New Jersey combined) has been low relative to past levels (less than half the 1965-1976 average rates). This is due both to the presence of the 1976 year-class and closure of beds to fishing in this area, and to the fact that most of the fishery has been concentrated off Delmarva in recent years. The relative exploitation rate off Delmarva has been high since 1978 (about 4 times the 1978-1979 New Jersey rate, and 20% higher than the 1974-1976 Delmarva rate), due mainly to the fact that about 90% on average of the total annual offshore surf clam catch has come from this area since 1978.

Results from the stock assessment indicate that total commercial-size (greater than 12 cm, shell length) biomass in the New Jersey area may increase by as much as 50-100% and will probably increase somewhat (perhaps 15%) off Delmarva beginning in 1982 (compared to January 1980 values) (F. Serchuk, NEFC, personal communication). Assuming, for example, that (1) separate quotas were applied to each area, (2) the biomass index increases by 75% and 15% from the average of the December 1978 and January 1980 survey values, and (3) a relative exploitation rate equal to the 1978-1979 average value was applied appropriately to each area, a total catch of about 36 million pounds from the two areas combined would result. This example, however, presupposes a very high level of exploitation in the Delmarva area (e.g., a catch of about 32 million pounds in this example). Catches in recent years from the Delmarva area have averaged about 28 million pounds annually, and have caused significant declines in commercial sized (i.e., spawning stock) abundance in this area.

If average relative exploitation rates for the New Jersey and Delmarva areas for the entire time series of data (1965-1979) are used instead with the other above assumptions, a 1982 catch of approximately 27.5 million pounds would be generated (10.5 million from the New Jersey area and 17 million from the Delmarva area). If, on the other hand, no significant increases in abundance (above 1980 estimates) occur in either region, and catches were limited to those resulting from the long-term average exploitation rates, a total quota of about 21 million pounds would be indicated (6 million pounds and 15 million pounds from New Jersey and Delmarva, respectively).

It is impossible at present to predict surf clam abundance in 1982 and beyond with great accuracy. Moreover, the nature of commercial and scientific data makes rigid use of specific exploitation rates for quota-setting purposes both undesirable and impractical. Available evidence suggests that an annual Optimum Yield of 30 million pounds will not significantly violate the historical balance between harvests and resource abundance, and should not seriously undermine the probability of successful future recruitment.

Ocean Quahogs

As the assessment in Section V-2 indicates, the ocean quahog resource is enormous relative to current catch levels, and could be reduced perhaps by a billion pounds before the MSY population size is reached. The fishery is not spread evenly across the entire resource, and is concentrated at present off New Jersey and Delmarva. Current annual catches in that area (about 20 million pounds), while larger than the probable MSY for that area (less than 15 million pounds) are, however, small compared to the total amount that could be harvested (about 500 million pounds) from the same area before MSY population size is reached. Neither the current harvest levels nor the proposed Optimum Yield (40-60 million pounds) should threaten future productivity of the ocean quahog resource in the foreseeable future, over the entire range of the species or in the area currently being fished.

VI. DESCRIPTION OF HABITAT

VI-1. Condition of the Habitat

No information has been produced since the original Plan and Amendments #1 and #2 were promulgated which would necessitate the revision or updating of this section.

VI-2. Habitat Areas of Particular Concern

No information has been produced since the original Plan and Amendments #1 and #2 were promulgated which would necessitate the revision or updating of this section.

VI-3. Habitat Protection Programs

No special habitat protection programs exist in the habitat of the species that are the subjects of this Plan. Sampling for pollution is carried out by both NMFS and the Environmental Protection Agency (EPA) and within the territorial sea by various state agencies. Habitat protection programs are administered by a variety of Federal agencies including the Bureau of Land Management of the Interior Department; the Coast Guard, and EPA. State Coastal Zone Management Programs are discussed in Section XV of this Amendment.

Studies on the effects of ocean dumping are recommended in Section XVI.

VII. FISHERY MANAGEMENT JURISDICTION, LAWS, AND POLICIES

VII-1. Management Institutions

The US Department of Commerce, acting through the Mid-Atlantic Fishery Management Council, pursuant to the MFCMA, as amended, has authority to manage the stocks.

VII-2. Treaties and International Agreements

No treaties or international agreements exist relative to surf clams or ocean quahogs.

VII-3. Federal Laws, Regulations, and Policies

The only known Federal law that regulates the management of the surf clam and ocean quahog fisheries is the MFCMA, as amended. The Water Pollution Control Act, as amended, is important in maintaining the habitat of surf clams and ocean quahogs. Federal law provides for financial assistance for commercial fisheries. Part 251, Title 50, CFR, sets forth this program as operated by NMFS. On 12 July 1977 NMFS issued a final rulemaking establishing conditional fisheries status in the surf clam fishery. This means that financial assistance in that fishery will be limited to that which does not significantly increase harvesting capacity. No Indian treaty rights are known to exist relative to this fishery.

VII-4. State Laws, Regulations, and Policies

New Jersey, New York, Rhode Island, and Massachusetts have inshore clam fisheries (See Table 6).

The State of New Jersey has managed its surf clam resources within its territorial waters since 1975. The bait and commercial (food) fisheries are managed separately. Regulations on the commercial fishery are: (1) a ceiling on the number of vessels licensed to harvest surf clams, (2) a seasonal (December-April) quota of 500,000 bushels, (3) a weekly catch limitation of 750 bushels per vessel, and (4) no more than one dredge per vessel. No limitation is placed on the number of vessels which may fish for bait clams, nor are there seasonal or weekly catch restrictions on that fishery. Regulations which apply to both segments of the fishery are a landings fee of \$0.075 per bushel and catch reports. New Jersey does not require reporting by surf clam processors.

Several New England States have statutes that empower towns to regulate the harvest of shellfish to the limit of their territorial seas. None of these towns, however, has promulgated regulations which constitute management plans for either surf clams or ocean quahogs. In addition, all states within the range of either species have various statutes or regulations governing the harvesting, disposition, etc., of shellfish in general within state waters. These regulations are principally concerned with the prohibition of taking shellfish from polluted waters and time and location limitations on fishing to help enforce these regulations.

VII-5. Local and Other Applicable Laws, Regulations, and Policies

No local or other laws, regulations, or policies which specifically address the surf clam or ocean quahog fisheries are known to exist.

VIII. DESCRIPTION OF FISHING ACTIVITIES

VIII-1. History of Exploitation

No information has been produced since the original Plan and Amendments #1 and #2 were promulgated which would necessitate the revision or updating of this section.

VIII-2. Domestic Commercial and Recreational Fishing Activities

Surf Clams

Table 4 shows the weight and Table 5 the ex-vessel value of surf clam landings by state from 1950-1980. In most cases, these data were originally collected as bushels of clams landed and were converted to pounds of meats based on a factor of 17 pounds per bushel. Surf clam landings in New England have traditionally been converted to pounds of meats using a conversion factor of 11 pounds/bushel. (The larger factor approximates the weight of the complete shucked meats; the smaller factor approximates the meat weight per bushel which is used by the processing plants). In Table 4, therefore, New England surf clam landings are given in 17 pounds per bushel form, in order to facilitate comparisons with the Mid-Atlantic fishery.

The surf clam fleet has usually concentrated its efforts in one area until the catch rate began to decline, and then has moved 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, which greatly increased the capacity of processing plants, coupled with the expansion of the fishing grounds, resulted in ever-increasing surf clam landings beginning around 1970. A peak catch of over 96 million pounds of meats (roughly, 5.6 million bushels) was recorded in 1974, about 2.5 times the weight landed only a decade earlier.

After 1974, surf clam landings began to decline rapidly, to approximately 49 million pounds in 1976, the last full year prior to implementation of the Plan. The Plan was implemented by the Secretary of Commerce in November, 1977, and the slight increase in total surf clam landings that year, to about 52 million pounds, was undoubtedly due at least in part to greatly increased effort by the industry (aggravated by the significant increase in the number of vessels which entered the fishery that year) in anticipation of the stringent quota management and the vessel moratorium imposed by the Plan.

The Plan stipulates an annual surf clam Optimum Yield of 1.8 million bushels (about 30 million pounds of meats) from the FCZ. Annual reported landings were about 39.6 million pounds in 1978, about 35.1 million pounds in 1979, and about 34.7 million pounds (from the FCZ) in 1980. It must be recognized that, while surf clam landings have been decreasing, ocean quahog landings have been increasing rapidly (approximately 33.8 million pounds of meats in 1980), so that the total supply of clam meat available (approximately 71.8 million pounds of meat in 1980) is relatively high.

Table 6 shows surf clam landings by water area. The dependence of the fishery on the beds off southern New Jersey and Delmarva (Areas 621 and 622) is significant.

The Plan provides a maximum surf clam fishing week of 96 hours. The hours of fishing may be adjusted as necessary by the Regional Director to provide that the quarterly quotas can be harvested and to minimize the chances of closures. Table 7 shows the allowable fishing times since the Plan was implemented through the end of calendar year 1980. The maximum hours were in effect for only one month (January 1978). There have been only two closures, both in 1978, one of 3 weeks and one of 1 week. Of the 162 fishing weeks since the Plan was implemented through 1980, 91 were at 24 hours, 29 were at 36 hours, 34 were at 48 hours, 4 were at 96 hours, and 4 were closures, an average of 32.4 hours per week over the 162 weeks. This is some indication of the capacity of the fleet relative to the quota.

**Table 4. Surf Clam Landings by State
(thousands of pounds of meat)**

<u>Year</u>	<u>New York</u>	<u>New Jersey</u>	<u>Delaware</u>	<u>Maryland</u>	<u>Virginia</u>	<u>New England</u>	<u>Total#</u>	<u>FCZ</u>
1950	3286	4298	-	130	-	43	7757	unk
1951	4046	6420	-	1532	-	34	12032	unk
1952	4138	7418	-	1089	-	5	12650	unk
1953	3345	6578	-	2454	-	-	12377	unk
1954	3360	6877	-	1346	-	359	11942	unk
1955	2026	8278	-	1695	-	36	12035	unk
1956	2368	11583	2	1850	-	190	15993	unk
1957	1599	15224	192	934	-	6	17955	unk
1958	429	12462	780	792	-	2	14665	unk
1959	514	20164	1705	850	-	3	23236	unk
1960	722	23448	478	420	-	5	25073	unk
1961	722	26697	-	71	-	19	27509	unk
1962	840	29830	99	75	-	15	30859	unk
1963	974	37548	-	64	-	-	38586	unk
1964	1218	36875	-	38	-	20	38151	unk
1965	1505	42307	-	275	-	1	44088	unk
1966	1840	43174	-	64	-	55	45133	unk
1967	2305	41589	-	1149	-	25	45068	unk
1968	3008	32181	-	5328	17	28	40562	unk
1969	3431	36039	2757	7127	208	20	49582	unk
1970	4182	39669	8734	13681	889	253	67408	unk
1971	3688	28721	7694	7752	4507	268	52630	unk
1972	2713	21332	8551	7330	23384	249	63559	unk
1973	3319	21588	6630	7448	43323	96	82404	unk
1974	3951	22657	5817	5426	58219	63	96134	74430
1975	4580	35550	2315	5351	39088	110	86993	43620
1976	3455	24378	-	7135	14064	165	49217	42558
1977	3425	23130	-	8393	15791	1055	51793	43255
1978	2399	15223	-	8367	12778	820	39587	31394
1979*	1551	12325	-	7757	12514	1242	35391	29070
1980*	2023	9636	-	11429	14415	869	38372	34718

* Preliminary.

Includes any unallocated catches.

unk = unknown.

Source: Fishery Statistics of the US and unpublished NMFS data.

**Table 5. Ex-Vessel Value of Surf Clam Landings by State
(thousands of dollars)**

<u>Year</u>	<u>New York</u>	<u>New Jersey</u>	<u>Delaware</u>	<u>Maryland</u>	<u>Virginia</u>	<u>New England</u>	<u>Total#</u>	<u>FCZ</u>
1950	331	416	-	11	-	8	766	unk
1951	422	622	-	138	-	6	1188	unk
1952	431	802	-	174	-	1	1408	unk
1953	418	790	-	204	-	-	1412	unk
1954	420	844	-	168	-	26	1458	unk
1955	253	967	-	141	-	4	1365	unk
1956	306	1277	@	173	-	26	1782	unk
1957	220	1867	18	134	-	1	2240	unk
1958	69	1317	93	93	-	@	1572	unk
1959	61	1622	170	70	-	1	1924	unk
1960	85	1546	48	34	-	@	1713	unk
1961	65	1693	-	6	-	2	1766	unk
1962	76	1917	9	6	-	2	2010	unk
1963	91	2580	-	5	-	-	2676	unk
1964	109	2504	-	3	-	3	2619	unk
1965	127	3048	-	22	-	@	3197	unk
1966	148	3714	-	6	-	8	3876	unk
1967	190	4051	-	106	-	5	4352	unk
1968	295	3299	-	536	2	5	4137	unk
1969	390	4278	324	894	24	3	5913	unk
1970	490	4685	935	1475	110	35	7730	unk
1971	438	3877	1030	981	527	38	6891	unk
1972	313	2780	1132	1151	2528	37	7941	unk
1973	413	2709	780	1167	4777	20	9866	unk
1974	719	2948	770	939	6836	13	12225	9533
1975	768	4721	362	1011	5682	26	12570	6639
1976	1089	10819	-	3829	7545	64	23346	21211
1977	1108	11784	-	4703	8684	455	26735	23684
1978	776	7549	-	4914	7384	294	20918	18117
1979*	676	6302	-	4534	7330	500	19841	16871
1980*	824	4802	-	5743	7607	334	19311	17885

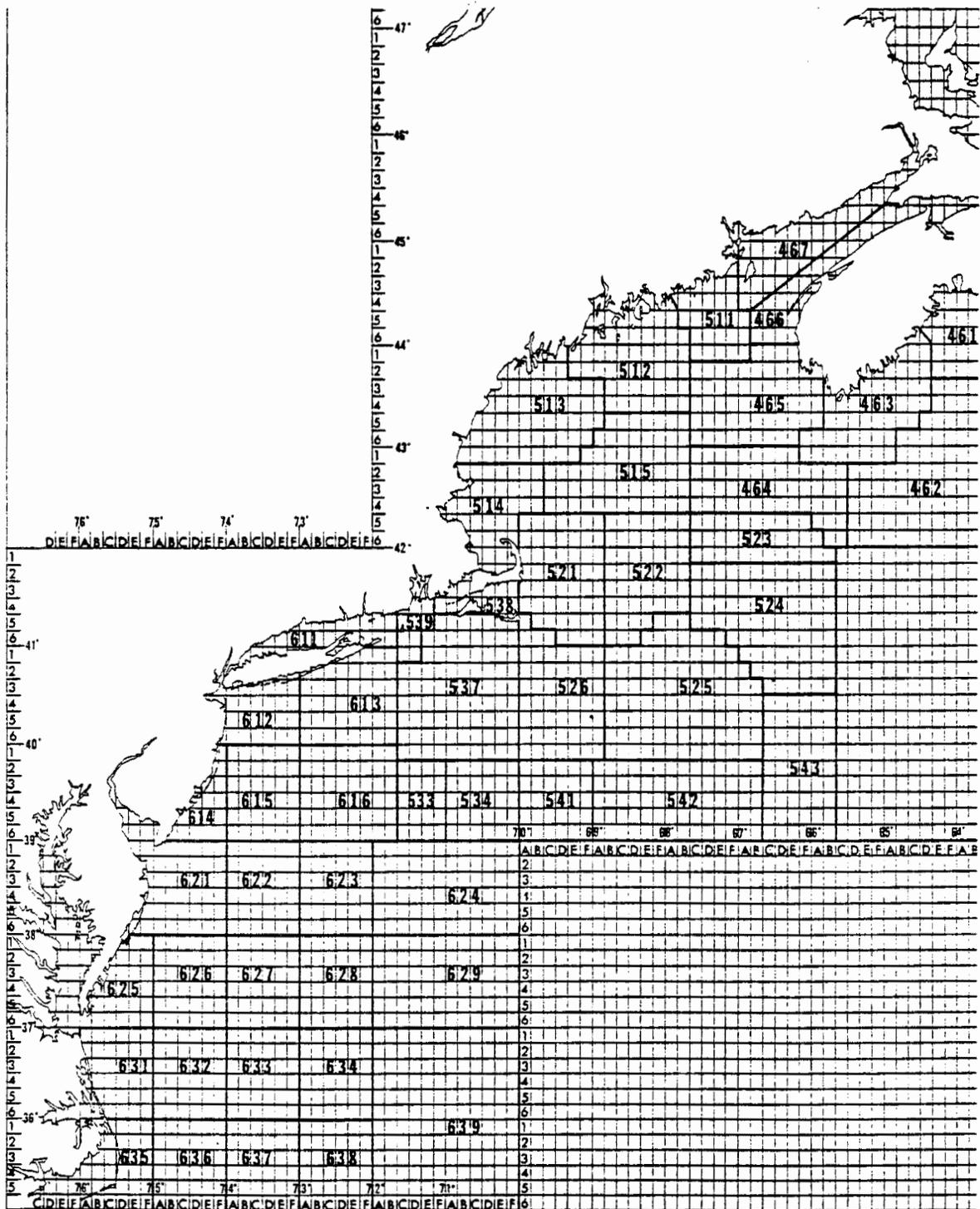
* Preliminary.

Includes any unallocated catches.

unk = unknown.

@ = less than \$500.

Source: Fishery Statistics of the US and unpublished NMFS data.



Partial Illustration Of NMFS Statistical Water Areas
For The Northwest Atlantic Ocean (See Table 6)

Figure 1

Table 6. Surf Clam Catches by Water Area¹, 1974-1979
(thousands of pounds of meats)

Water Area (Name or Coded Area)	1974	1975	1976	1977	1978	1979 ⁶
Massachusetts Inshore ²	32.0	72.6	105.2	462.1	194.0	unk
Massachusetts Offshore ³	-	-	26.7	286.3	-	unk
Rhode Island Inshore ⁴	31.2	37.1	32.6	306.3	542.8	unk
New York Inshore ⁵	-	-	-	-	8.8	6.4
Area 612	4,314.7	4,705.3	3,573.6	3,680.0	2,959.1	1,803.7
Area 614	11,930.5	32,986.9	13,376.4	7,277.0	5,047.3	1,938.0
Area 615	3,054.2	1,839.5	2,288.4	423.5	20.1	-
Areas 621 & 622	18,552.1	8,263.1	15,728.9	23,567.1	16,810.6	20,949.0
Area 625	860.8	650.1	1,730.5	11,481.2	4,715.7	3,608.6
Areas 626 & 627	-	-	298.1	3,377.4	8,144.0	5,018.2
Areas 631 & 632	57,358.6	38,438.2	12,035.6	932.5	1,061.1	823.3
Atlantic Ocean (unspec.)	-	-	20.4	-	83.5	-
Total	96,134.1	86,992.8	49,216.5	51,793.4	39,587.0	34,147.2

1. See Figure 1.
2. Includes Buzzards Bay, Cape Cod Bay, Nantucket Sound, and Vineyard Sound.
3. Atlantic Ocean waters within the territorial sea in 1976 and beyond the territorial sea after 1976.
4. Includes Block Island Sound, Long Island Sound, Sakonnet Point, and Atlantic Ocean waters within the territorial sea.
5. Areas other than those listed by number.
6. Preliminary and incomplete, and does not include New England.

unk = unknown.

Source: unpublished NMFS statistics.

Table 7. Allowable Surf Clam Fishing Times
17 November 1977 - 31 December 1980

Effective date	Allowable time
17 November 1977	48 hours/week
1 January 1978	96 hours/week
30 January 1978	48 hours/week
10 March 1978	Closure
1 April 1978	48 hours/week
7 May 1978	24 hours/week
1 October 1978	36 hours/week
30 October 1978	24 hours/week
21 December 1978	Closure
1 January 1979	24 hours/week
27 February 1979	36 hours/week
1 April 1979	24 hours/week
15 October 1979	36 hours/week
1 January 1980	24 hours/week
18 February 1980	36 hours/week
31 March 1980	24 hours/week
20 April 1980	36 hours/week
18 May 1980	48 hours/week
29 June 1980	24 hours/week
7 July 1980	48 hours/week
28 September 1980	24 hours/week

Ocean Quahogs

The ocean quahog fishery was traditionally a small industry operated out of Rhode Island ports. 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, the relatively high value of surf clams, the effects of surf clam quota management, 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 Plan implementation. Virtually the entire ocean quahog catch is now taken in the Mid-Atlantic area.

The New England ocean quahog fishery has been conducted almost entirely within the territorial sea, and only began to expand into offshore waters in 1977. About 94% of the 1978 New England quahog catch was taken in inshore waters. The New England fishery remains dominated by its Rhode Island component, which has been responsible for about 95% on average, of all New England ocean quahog landings from 1973-1978.

Table 8. Ocean Quahog Landings and Ex-Vessel Values by Water Area
(thousands of pounds and thousands of dollars)

Year	Territorial Sea		FCZ		Total	
	Landings	Ex-Vessel Value	Landings	Ex-Vessel Value	Landings	Ex-Vessel Value
1967	45	\$ 6	-	-	45	\$ 6
1968	225	29	-	-	225	29
1969	639	99	-	-	639	99
1970	1,747	305	-	-	1,747	305
1971	2,032	345	-	-	2,032	345
1972	1,401	235	-	-	1,401	235
1973	1,457	250	-	-	1,457	250
1974	838	146	-	-	838	146
1975	1,297	248	-	-	1,297	248
1976	1,497	379	4,104	\$ 1,238	5,601	1,617
1977	2,509	711	15,894	4,860	18,403	5,571
1978	2,686	767	20,279	5,940	22,965	6,707
1979	3,095	966	31,629	9,267	34,724	10,233
1980	3,215	992	30,617	9,195	33,832	10,187

VIII-3. Foreign Fishing Activities

The surf clam and ocean quahog fisheries are domestic fisheries only.

VIII-4. Interaction Between Domestic and Foreign Participants in the Fishery

There are no records of foreign (including Canadian) catches of either species in the northwest Atlantic.

IX. DESCRIPTION OF ECONOMIC CHARACTERISTICS OF THE FISHERY

IX-1. Domestic Harvesting Sector

Table 9 presents surf clam landings for 1978 by county. The concentration of the harvesting sector is obvious. Five counties accounted for almost 90% of all surf clam landings. Cape May County, New Jersey, alone accounted for 27.32% of all surf clam landings and for that county, surf clams accounted for 22.15% of all landings in quantity and 22.70% of all landings in value.

Ocean quahog landings by county are presented in Table 10. This fishery is even more concentrated than the surf clam fishery, with four counties accounting for 57% of all landings. Cape May County, New Jersey, was again first in quantity and value of landings in 1978. The Rhode Island counties are grouped in the Table to avoid publication of confidential data.

Table 9. 1978 Surf Clam and Total Landings by County
(quantity in thousands of pounds, value in thousands of dollars)

County	Surf Clams		All Species		Cumulative Share of Surf Clam Landings
	Quantity	Value	Quantity	Value	
Cape May, NJ ¹	10,816.4	5,717.5	48,838.8	25,187.8	27.32%
	27.32%	27.33%	22.15%	22.70%	
Worcester, MD	8,367.1	4,914.2	15,296.5	7,757.2	48.46
	21.14%	23.49%	54.70%	63.35%	
Accomac, VA	6,438.2	3,755.0	17,623.2	8,223.3	64.72
	16.26%	17.95%	36.53%	45.66%	
Northampton, VA	6,339.8	3,629.1	14,419.6	5,800.8	80.74
	16.01%	17.35%	43.97%	62.56%	
Atlantic, NJ	3,332.1	1,383.8	4,723.0	2,628.6	89.15
	8.42%	6.62%	70.55%	52.64%	
Nassau, NY	2,284.6	739.2	5,229.7	2,449.1	94.93
	5.77%	3.53%	43.69%	30.18%	
Ocean, NJ	879.9	401.8	19,895.3	9,288.8	97.15
	2.22%	1.92%	4.42%	4.33%	
Newport, RI ²	542.8	118.8	23,710.5	14,137.0	98.52
	1.37%	0.90%	2.29%	1.34%	
Monmouth, NJ	194.7	45.8	87,488.1	4,927.6	99.01
	0.49%	0.22%	0.22%	0.93%	
Bristol, MA ²	153.0	58.5	76,658.7	57,846.3	99.40
	0.39%	0.30%	0.20%	0.10%	
Kings, NY	105.1	34.0	2,527.2	790.3	99.66
	0.27%	0.16%	4.16%	4.31%	
Rockingham, NH ²	83.5	29.0	7,564.5	2,575.7	99.87
	0.21%	0.14%	1.10%	1.13%	
Barnstable, MA ²	21.3	9.3	57,829.3	30,672.8	99.93
	0.05%	0.04%	0.04%	0.03%	
Dukes, MA ²	17.9	8.1	7,554.7	7,432.3	99.97
	0.05%	0.04%	0.24%	0.11%	
Suffolk, NY	8.8	2.9	27,797.2	29,685.4	99.99
	0.02%	0.01%	0.03%	#	
Nantucket, MA ²	1.7	0.8	903.5	1,800.4	100.00
	#	#	0.19%	0.04%	
New England ^{2,3}	820.2	294.4	179,221.4	114,464.5	
	2.07%	1.41%	0.47%	0.26%	
Mid-Atlantic ³	38,766.7	20,623.3	243,838.6	96,739.0	
	97.93%	98.59%	15.90%	21.32%	
Grand Total ^{2,3}	39,586.9	20,917.7	423,060.0	211,203.4	
	100.00%	100.00%	9.47%	9.90%	

Less than 0.01.

1. Percentages under "Surf Clams" columns refers to shares of total surf clam landings. Percentages under "All Species" columns indicate percentages of total county landings attributable to surf clams.

2. New England landings equal reported weight multiplied by 17/11.

3. May not equal sum of entries due to rounding. Totals for only those counties listed above.

Table 10. 1978 Ocean Quahog and Total Landings for Selected Counties
(quantity in thousands of pounds, value in thousands of dollars)

County	Ocean Quahogs				All Species			
	Quantity		Value		Quantity		Value	
	Pounds	Share*	\$	Share*	Pounds	Share**	\$	Share**
Cape May, NJ	16,358.6	66.68%	4,901.9	65.73%	48,838.8	33.50%	25,187.8	19.46%
Bristol, Newport, & Washington, RI	2,684.7	10.94	779.6	10.45	83,826.4	3.20	27,845.0	2.80
Ocean, NJ	735.6	3.00	229.7	3.08	19,895.3	3.70	9,288.8	2.47
Atlantic, NJ	152.7	0.62	47.2	0.63	4,723.0	3.23	2,628.6	1.80

* Share of total ocean quahogs landings.

** Share of total county landings attributable to ocean quahogs.

Vessel Data

The number of vessels in the surf clam fishery gradually increased from 68 in 1965 to 104 in 1970. The number of vessels then declined slightly from 1970 to 1975. The fleet increased to a 1978 total of 157 active vessels, that is, vessels that filed logbook reports indicating surf clams had been landed. In 1979 there were 143 active vessels.

The vessels in the surf clam fleet vary tremendously with respect to their physical characteristics. In 1979 the tonnage per vessel ranged from 1 to 306 tons, with an average of 108 tons. Vessel length ranged from 18 to 146 feet, with an average of 80 feet. The horsepower of the surf clam vessels ranged from 70 to 1750, with an average of 435. Crew size ranged from 2 to 7 men, with an average of 3 men. The size of the dredge ranged from 22 to 240 inches with an average length of 86 inches. These data are summarized in Table 11. Table 12 contains data on the size distribution of these vessels.

Table 13 contains information on overall industry performance during 1980. Since some of the vessels are actively engaged in the inshore New Jersey surf clam fishery (which does not fall under the purview of this Plan) in addition to the offshore fisheries, in order to properly evaluate the overall performance of the industry these inshore activities must be included. In 1980, total ex-vessel revenues generated at the harvesting sector level were about \$28 million, \$19 million from surf clams and \$9 million from ocean quahogs.

Table 14 contains information on the distribution of these revenues among the 143 vessels in the fleet. These vessels were divided into three different groups, depending on the gross registered tonnage (GRT) of the vessels. These were the three vessel classes utilized in the Plan for analyses. Class 1 vessels are less than 50 GRT, Class 2 vessels are between 51 and 100 GRT, and Class 3 vessels are greater than 100 GRT. Of the 143 vessels examined here, there were 21 Class 1 vessels (15% of total), 52 Class 2 vessels (36%), and 70 Class 3 vessels (49%). Class 3 vessel harvesting activities generated 76% of the total industry revenues, Class 2 vessels generated 19% of the total industry revenues, and Class 1 generated about 5% of the total revenues. On a species basis, Class 3 vessels generated about 71% of the FCZ surf clam revenues, 18% of the inshore clam revenues, and 96% of the quahog revenues. Class 2 vessels accounted for 24% of the FCZ surf clam revenues, 54% of the inshore clam revenues, and 4% of the quahog revenues. Class 1 vessels accounted for 5% of the FCZ surf clam revenue, 28% of the inshore clam revenues, and 0% of the quahog revenues.

Comparisons between 1978 and 1979 are most interesting. While the number of Class 1 vessels active in the fishery did not change, there were 4 fewer Class 2 vessels active in 1979 over 1978 and 6 fewer Class 3 vessels. There was also a dramatic shift in the shares of the revenues to the Class 3 vessels from the other classes. For FCZ surf clams, the Class 3 share rose from 66% in 1978 to 71% in 1979. For quahog revenues, the Class 3 share rose from 79% in 1978 to 96% in 1979. In terms of total revenues, the Class 3 vessels gained by 10%, at the expense of the Class 2 vessels.

Tables 15,16, and 17 contain information on the concentration of the catch among the vessels in the fleet, irrespective of tonnage size. Not all of the vessels were engaged in harvesting all of the species. Specifically, in 1979, 138 vessels recorded at least a bushel of FCZ clams, but only 51 vessels were active in the quahog fishery, and 50 vessels were active in the inshore fishery.

One fact that is clearly illustrated in these tables is that of fleet specialization. For example, in Table 15 it can be seen that 44 vessels (32% of the total harvesting any FCZ clams) harvested 70% of the surf clams but these same vessels accounted for only 10% of the quahog revenues and 6% of the inshore clam revenues. In Table 16, it can be seen that 19 vessels accounted for 90% of the total quahog revenues but only 7% of the FCZ clams and 8% of the inshore clams. Similarly in Table 17, it can be seen that 35 vessels accounted for 90% of the inshore clam revenues but only 10% and 8% of the FCZ clam and FCZ quahog revenues, respectively.

Table 18 contains information on the average gross revenues of the vessels in 1979. The average gross revenue of the 21 Class 1 vessels was \$61,035 per vessel, down from \$61,358 in 1978. The average gross revenue of the 52 Class 2 vessels was \$94,810 per vessel, down from \$128,352 in 1978. The average gross revenue of the Class 3 vessels was \$274,243, up from \$217,453 in 1978. While the averages are interesting in their own right, it is more meaningful to examine the distribution of the average gross revenues within a vessel class.

Tables 19,20, and 21 present detailed performance profiles for each of the vessel classes for both 1978 and 1979. The vessels were divided into groups depending on 1978 average gross revenues.

Table 11. Physical Characteristics of Surf Clam Vessels, 1979

	<u>Length (feet)</u>	<u>Gross Tonnage</u>	<u>Dredge Blade (inches)</u>	<u>Horsepower</u>	<u>Crew Size</u>
Minimum	18	1	22	70	2
Maximum	146	306	240*	1750	7
Average	80	108	86**	435	3

* represents double 120" dredges; largest single dredge was 200".

** the most commonly used dredge size was 60".

Table 12. Estimated Vessel Distribution by Tonnage Class in the Surf Clam Fishery, 1965-1980

<u>Year</u>	<u>Total</u>	<u>Class 1</u>	<u>Class 2</u>	<u>Class 3</u>
1965	68	33	33	2
1966	74	34	34	6
1967	91	40	40	11
1968	86	38	42	6
1969	92	32	56	4
1970	104	33	59	12
1971	92	28	46	18
1972	90	29	44	17
1973	93	32	44	17
1974	98	35	46	17
1975	99	35	46	18
1976	122	33	55	34
1977a	155	22	56	77
1978b	157	21	58	78
1979c	143	21	52	70
1980d	123	13	49	61

- a. Licenses issued as of 31 December 1977.
- b. Vessels active in the fleet as of 31 December 1978, based on logbook reports.
- c. Vessels active in the fleet as of 31 December 1979, based on logbook reports.
- d. Vessels active in the fleet as of 31 December 1980, based on logbook reports.

Source: unpublished NMFS statistics.

Table 13. 1979 Industry Performance Summaries

	<u>Offshore Clams (FCZ)</u>	<u>Inshore Clams (all areas)</u>	<u>Ocean Quahogs (FCZ)</u>
Total Landings (bushels)	2,042,235	177,588	3,061,700
Average Price/Bushel	\$ 8.76	\$ 6.88	\$ 3.00
Total Revenues	\$ 17,885,000	\$ 1,222,000	\$ 9,195,000
Grand Total		\$ 28,302,000	
% by Species	63%	4%	32%

Source: Fisheries of the US, 1980.

Table 14. Distribution of Revenues by Vessel Class, 1978 and 1979*

	<u>Class 1</u>		<u>Class 2</u>		<u>Class 3</u>	
	<u>1978</u>	<u>1979</u>	<u>1978</u>	<u>1979</u>	<u>1978</u>	<u>1979</u>
Number of Active Vessels	21	21	56	52	76	70
Percent of Total Vessels	13%	15%	37%	36%	50%	49%
Percent of Total Revenues	5%	5%	29%	19%	66%	76%
Percent of FCZ Clam Revenues	5%	5%	28%	24%	66%	71%
Percent of Inshore Clam Revenues	22%	28%	61%	54%	17%	18%
Percent of Quahog Revenues	-	-	21%	4%	79%	96%

* based only on records with time fished and landings.

Source: unpublished NMFS statistics.

Table 15. Concentration of FCZ Surf Clam Catch, 1979

<u>% Surf Clam Catch</u>	<u>No. of Vessels</u>	<u>No. of Vessels (Cumulative)</u>	<u>% of Total Vessels Landing FCZ Clams</u>	<u>% of Quahogs (Cumulative)</u>	<u>% of Inshore Clams (Cumulative)</u>
10	3	3	2%	0%	0%
20	4	7	5	0	0
30	4	11	8	-	0
40	6	17	12	5	0
50	8	25	18	6	0
60	8	33	24	6	0
70	11	44	32	10	6
80	14	58	42	11	9
90	20	78	57	17	27
100	60	138	100	85	86

Source: unpublished NMFS statistics.

Table 16. Concentration of Quahog Catch, 1979

<u>% Quahog Catch</u>	<u>No. of Vessels</u>	<u>No. of Vessels (Cumulative)</u>	<u>% of Total Vessels Landing Quahogs</u>	<u>% of FCZ Clams (Cumulative)</u>	<u>% of Inshore Clams (Cumulative)</u>
10	1	1	2%	-%	-%
20	1	2	4	-	-
30	1	3	6	-	-
40	1	4	8	-	-
50	2	6	12	-	-
60	2	8	16	1	-
70	2	10	20	1	-
80	4	14	28	5	-
90	5	19	38	7	8
100	32	51	100	26	8

Source: unpublished NMFS statistics.

Table 17. Concentration of Inshore Clam Catch, 1979

<u>% Inshore Clam Catch</u>	<u>No. of Vessels</u>	<u>No. of Vessels (Cumulative)</u>	<u>% of Total Vessels Landing Inshore Clams</u>	<u>% of FCZ Clams (Cumulative)</u>	<u>% of FCZ Quahogs (Cumulative)</u>
10	2	2	4%	-%	-%
20	3	5	10	1	2
30	3	8	16	2	2
40	3	11	22	3	4
50	4	15	30	4	4
60	4	19	38	6	6
70	4	23	46	7	6
80	6	29	58	9	6
90	6	35	70	10	8
100	15	50	100	13	18

Source: unpublished NMFS statistics.

Table 18. Performance of Permitted Vessels in Surf Clam, Ocean Quahog, & Inshore Combined, 1978 & 1979

<u>Vessel Class</u>	<u>Number of Vessels</u>		<u>Average Gross Revenues</u>	
	<u>1978</u>	<u>1979</u>	<u>1978</u>	<u>1979</u>
1	21	21	\$ 61,358	\$ 61,035
2	56	52	128,352	94,810
3	76	70	217,453	274,243

Source: unpublished NMFS statistics.

Table 19. Performance Profiles, Class 1

	<u>Group I</u>	<u>Group II</u>	<u>Group III</u>	<u>Group IV</u>	<u>All</u>
1978 Group FCZ Revenues	0-25,000	26-50,000	51-75,000	76,000+	-
No. of Vessels	6	4	3	5	18
78 Gross Revenue	19179	69220	69640	116326	65707
79 Gross Revenue	36413	70635	58962	110861	68456
78 FCZ Clam Revenue	7695	33576	69640	104680	50711
79 FCZ Clam Revenue	29716	19460	55614	86418	47504
78 Quahog Revenue	1489	0	0	0	497
79 Quahog Revenue	34	0	0	2854	804
78 Inshore Revenue	10031	35644	0	11646	14499
79 Inshore Revenue	6663	51175	3348	21589	20148
78 FCZ Clam Hours*	75	302	484	545	324
79 FCZ Clam Hours*	195	91	428	446	281
78 FCZ Clam \$/Hour*	92	100	135	180	145
79 FCZ Clam \$/Hour*	152	127	127	194	162
78 Quahog Hours*	5	0	0	0	2
79 Quahog Hours*	0.3	0	0	18	5
78 Quahog \$/Hour*	265	0	0	0	265
79 Quahog \$/Hour*	101	0	0	162	161

* Uses only records with time fished and landings.

Source: unpublished NMFS statistics.

Table 20. Performance Profiles, Class 2

	<u>Group I</u> 0-50,000	<u>Group II</u> 51-100,000	<u>Group III</u> 101-150,000	<u>Group IV</u> 151-200,000	<u>Group V</u> 201,000+	<u>All</u> -
1978 Group FCZ Revenues						
No. of Vessels	11	15	7	11	5	49
78 Gross Revenue	58056	105736	115477	169166	219347	122257
79 Gross Revenue	60611	89257	90904	123648	163059	98358
78 FCZ Clam Revenue	19641	63332	112293	144064	219309	94558
79 FCZ Clam Revenue	23469	65884	86097	110186	163059	79111
78 Quahog Revenue	3888	15886	2396	23345	38	11323
79 Quahog Revenue	8438	2656	1488	10674	0	5316
78 Inshore Revenue	34527	26518	788	1757	0	16376
79 Inshore Revenue	28704	20717	3319	2788	0	13886
78 FCZ Clam Hours*	137	366	548	647	822	450
79 FCZ Clam Hours*	158	333	493	537	725	403
78 FCZ Clam \$/Hour*	125	159	184	204	229	189
79 FCZ Clam \$/Hour*	147	187	174	205	222	193
78 Quahog Hours*	13	75	7	89	2	47
79 Quahog Hours*	22	9	5	65	0	23
78 Quahog \$/Hour*	291	200	349	248	24	229
79 Quahog \$/Hour*	368	259	281	163	0	222

Table 21. Performance Profiles, Class 3

	<u>Group I</u> 0-100,000	<u>Group II</u> 101-200,000	<u>Group III</u> 201-300,000	<u>Group IV</u> 301-400,000	<u>Group V</u> 401,000+	<u>All</u> -
1978 Group FCZ Revenues						
No. of Vessels	18	19	13	7	12	69
78 Gross Revenue	50540	164150	249483	351883	474339	227094
79 Gross Revenue	146166	182377	349344	368682	485095	277103
78 FCZ Clam Revenue	42816	138678	184380	271598	316176	166635
79 FCZ Clam Revenue	127230	134492	201714	227024	217342	169374
78 Quahog Revenue	3435	18446	63275	80285	158163	57061
79 Quahog Revenue	12540	44772	143403	141658	267311	104330
78 Inshore Revenue	4289	7026	1828	0	0	3398
79 Inshore Revenue	6396	3113	4227	0	442	3399
78 FCZ Clam Hours*	224	559	574	809	674	531
79 FCZ Clam Hours*	428	536	632	710	541	545
78 FCZ Clam \$/Hour*	171	209	262	299	418	276
79 FCZ Clam \$/Hour*	296	250	319	320	402	310
78 Quahog Hours*	14	94	169	200	317	137
79 Quahog Hours*	45	175	322	382	564	257
78 Quahog \$/Hour*	242	186	356	366	499	380
79 Quahog \$/Hour*	248	251	442	370	474	399

* Uses only records with time fished and landings. Source: unpublished NMFS statistics.

Summary of Key Vessel Groups

Tables 22 and 23 are provided to link the data from Tables 19, 20, and 21 for the various vessel classes and groups. While the 1978 groups (Table 22) and the 1979 groups (Table 23) may be different, the two tables are included to show the relative movement of the vessel class groups over time, particularly with reference to the performance of the lower ranked Class 3 groups relative to the Class 2 groups. In 1978 the highest performance group in Class 2 (Class 2 - Group V) ranked 3 out of 6 and the second best Class 2 group ranked 5. In 1979 the highest performing Class 2 group ranked 5 and the second best Class 2 group was not among the top 6. In other words, in 1979, all of the five Class 3 groups ranked in the top 6, while, in 1978, only the top four Class 3 groups ranked in the top 6.

As shown in Table 23, in 1979, the 12 vessels (9% of all vessels) in Class 3 - Group V (in the Table this is "C3-V"), accounted for 23% of the total revenues of all species. The groups were ranked on the basis of the average total revenue generated per vessel in the group. Thus, in 1979, 74 vessels (54% of those examined) accounted for 79% of total revenues, 76% of offshore surf clam revenues, 17% of inshore surf clam revenues, and 96% of quahog revenues. The increasing importance of the larger vessels is obvious from these tables.

Table 22. Summary of Key Vessel Groups, 1978

Group Rank	Group	Number of Vessels	Cumulative Number of Vessels	Cumulative % of Total Vessels	Cumulative % of Total Revenue	Cumulative % of Offshore Clam Revenue	Cumulative % of Inshore Clam Revenue	Cumulative % of Quahog Revenue
1	C3-V	4	4	3%	10%	8%	-%	16%
2	C3-IV	17	21	14	36	33	-	54
3	C2-V	7	28	18	44	37	-	65
4	C3-III	16	44	29	59	54	6	85
5	C2-IV	13	57	37	68	60	12	90
6	C3-II	19	76	50	80	79	22	95

Source: unpublished NMFS statistics.

Table 23. Summary of Key Vessel Groups, 1979

Group Rank	Group	Number of Vessels	Cumulative Number of Vessels	Cumulative % of Total Vessels	Cumulative % of Total Revenue	Cumulative % of Offshore Clam Revenue	Cumulative % of Inshore Clam Revenue	Cumulative % of Quahog Revenue
1	C3-V	12	12	9%	23%	16%	-%	43%
2	C3-IV	7	19	14	33	26	-	56
3	C3-III	13	32	24	51	42	4	81
4	C3-II	19	51	38	65	57	9	92
5	C2-V	5	56	41	68	62	9	92
6	C3-I	18	74	54	79	76	17	96

Source: unpublished NMFS statistics.

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. The combined quotas of surf clams and ocean quahogs is currently approximately 70,000,000 pounds. A preliminary estimate of the 1980 FCZ combined catch is approximately 58 million pounds. As shown in Table 7, for only one month since the Plan went into effect has surf clam fishing been permitted to occur at the maximum rate allowed (96 hours per week). Most of the time, fishing has been at a rate of 24 hours per week. In addition, it is known that, particularly during 1979, the capacity of many surf clam vessels was increased by adding dredges, increasing the size of dredges, and increasing the capacity of other equipment. Given the above, 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 probable quotas for surf clams and ocean quahogs.

IX-2. Domestic Processing Sector

This section provides a descriptive analysis of the surf clam and ocean quahog processing sector for the 1970-1979 period.

Surf clam based products have historically comprised the vast majority of the total US production of canned clam chowders, whole and minced clams, breaded clam products, and canned sauces and juices. These four product groups are the principal finished product lines for all clam products. However, since 1977, quahog meats have been increasingly used as a substitute for surf clams in these products. For 1977, quahog based products comprised about 12% of the value of all clam product production compared with an average of less than 1% during the 1971-1976 period. For 1979, this percentage is reported to have grown to 15% of the value of all clam finished product production.

In this section 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 1979, when converted to live meat weight equivalents, is 256% 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).

Number of Plants, Production, and Employment

Table 24 presents data on the number of surf clam and ocean quahog processing plants by state for 1970-1979. Except for 1979, there has been very little change in the total number of plants since 1972. Since individual plant information was unavailable for analysis, the reasons for the decline in total number of plants in 1979 is unknown; nor is it known what the resulting impacts were on the processing capacity of the industry.

Table 24. Number of Surf Clam/Ocean Quahog Processing Plants by State

Year	Plants Processing Surf Clams/Ocean Quahogs										Plants Processing Only Ocean Quahogs	Plants Processing Only Surf Clams
	ME	MA	RI	NY	NJ	DE	MD	PA	VA	Total		
1970	1	6	5	5	12	1	9	3	6	48	3	44
1971	1	7	5	5	16	3	9	2	7	55	3	51
1972	1	5	5	4	14	3	8	2	8	50	4	45
1973	1	6	3	4	15	3	7	2	6	47	1	44
1974	1	6	4	4	15	3	7	2	7	49	1	45
1975	1	7	5	4	13	3	7	2	7	49	2	45
1976	1	6	4	3	15	3	6	2	8	48	2	45
1977	1	5	4	3	13	3	7	3	8	47	2	36
1978	1	5	3	3	14	3	6	3	11	49	3	34
1979	1	5	3	3	11	3	6	2	10	44	3	30

Source: NMFS Processed Products Survey, December 1980.

While Table 24 presents only numbers of plants and not their physical capacities, Table 25, given the degree of double counting, indicates the trends in their level of production, revenues, and employment. Three increasing trends are evident from this table. Excluding the peak production year of 1974, output has increased from 117.6 million pounds to 161.9 million pounds. Plant surf clam/ocean quahog revenues increased to a peak of \$157.4 million in 1979. The dependency of these plants on surf clam and ocean quahog revenues (the ratio of surf clam/ocean quahog revenues to total plant revenues) has also increased. This last trend indicates that processors can switch to surf clam/ocean quahog production from other product production, and, thus, processing capacity is sensitive to the relative profitability of the various potential alternative product lines.

When surf clam/ocean quahog revenues are adjusted for inflation, 1977 becomes the peak year. However, deflated revenues for the 1976-1979 period are much higher than any other previous period. It is unclear whether this is due to an increase in consumer demand for these products, the passing on of higher processing costs (such as increased fuel costs) to the consumer, or the limitations in surf clam production at the harvester level. If deflated surf clam/ocean quahog revenues are divided by output, the average processed product price per pound reaches a high of \$0.52 per pound in 1977, but falls to \$0.41 in 1979.

Another decreasing trend indicated in Table 25 concerns the total average annual plant employment and the estimated surf clam/ocean quahog employment. Since individual plant information was unavailable on the size distribution, dependency of the plants on surf clam/ocean quahog products, and the amount of each finished product produced by each plant, employment by product line was impossible to estimate. However, total employment for the industry can be estimated by allocating employment based on the value of surf clam/ocean quahog production relative to total plant revenues. For 1979, this method estimates that surf clam/ocean quahog processing employment was 1,768 man years. While estimated employment has been declining since 1977, it is unclear whether this decline was due to general conditions of the economy, economic conditions within the processing sector, or adoption of labor saving processing technologies.

While the total number of plants and employment has fallen, Table 26 indicates that average surf clam/ocean quahog revenue per plant has increased, whether these revenues are adjusted for inflation or not. However, in order to get a better picture of the surf clam/ocean quahog processing sector, plant capacities per product line as well as production costs per product line must be known, and these data do not exist at this time.

Table 25. Total Plant Surf Clam/Ocean Quahog Output, Revenues, and Employment (output in thousands of pounds of meat, revenue in thousands of dollars)

Year	Surf Clam/Ocean Quahog			Total Plant Revenues	Ratio of Surf Clam/Ocean Quahog Revenue to Total Plant Revenue	Average Annual Employment	Est. Surf Clam/Ocean Quahog Employment**
	Output	Revenue	Revenue (1967 \$)*				
1970	117623	50341	45599	119874	0.42	4399	1847
1971	133878	53882	47307	126838	0.42	4095	1740
1972	126088	54792	46005	136114	0.40	4022	1619
1973	152192	73629	54661	202362	0.36	4580	1666
1974	177162	92317	57662	198630	0.46	4208	1956
1975	151441	94058	53778	192347	0.49	4303	2104
1976	137027	124508	68074	276436	0.45	4062	1830
1977	143705	145347	74844	289353	0.50	3814	1916
1978	138975	146743	70111	308622	0.48	3829	1821
1979	161903	157382	65850	322288	0.49	3619	1768

* Based on National Producer Price Index (1967 = 100).

** Based on ratio of surf clam/ocean quahog revenues to total plant revenues.

Table 26. Average Plant Surf Clam/Ocean Quahog Revenues (revenues in thousands of dollars)

Year	Number of Plants	Average Plant Surf Clam/Ocean Quahog Revenues	
		Current	Deflated*
1970	48	1,049	950
1971	55	980	860
1972	50	1,096	920
1973	47	1,567	1,163
1974	49	1,884	1,177
1975	49	1,920	1,098
1976	48	2,594	1,418
1977	47	3,092	1,592
1978	49	2,995	1,431
1979	44	3,577	1,497

*Current values adjusted to account for inflation, based on National Producer Price Index.

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. Generally, quahogs have not been successfully used in the breaded strip lines.

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. On the other hand, 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. These trends for the various intermediate and finished products are shown in Table 27.

Table 27. Surf Clam/Ocean Quahog Processing Output and Revenues
(output in thousands of pounds, revenues in thousands of dollars)

Year	Canned Chowder		Canned Minced Clams		Clam Juices		Misc. Raw Clams, White Sauce Base		Misc. Raw Clams, Red Sauce Base	
	Output	Revenue	Output	Revenue	Output	Revenue	Output	Revenue	Output	Revenue
1970	49706	14215	8479	9812	2945	593	*	*	*	*
1971	55886	15599	9345	9511	3668	631	1716	918	1635	786
1972	58487	17116	10482	9121	3490	480	2033	1181	1334	681
1973	67438	21843	13779	14513	5777	1040	2672	1703	1214	780
1974	66926	24290	13250	16793	4768	1441	4742	2041	1807	1272
1975	56615	21594	13537	17755	4838	2054	2943	2041	1646	1140
1976	47144	22267	7520	14356	7548	1457	3625	3957	1350	1476
1977	51813	34321	9742	23159	6787	2373	4614	4807	2164	2061
1978	47718	30436	9716	24819	8245	2728	2839	2992	1337	1398
1979	50788	32417	10663	24778	9957	2634	3906	4906	1363	1387

Year	Frozen Breaded Cooked Clams		Frozen Breaded Raw Clams		Frozen Shucked Clams		Fresh Shucked Clams	
	Output	Revenue	Output	Revenue	Output	Revenue	Output	Revenue
1970	2279	2141	1298	1200	14430	6705	32325	11948
1971	2506	2307	*	*	8050	3361	46479	17486
1972	6719	6537	*	*	8740	4084	30012	11488
1973	8431	8390	2973	2587	9406	4863	36209	14634
1974	10465	11072	2764	2570	8549	4370	60489	24138
1975	12122	14067	6721	6991	6776	3992	43208	21643
1976	12146	17875	4880	8648	9994	9527	40968	43676
1977	10661	16814	4908	8329	14314	14415	36999	36909
1978	10139	18115	5359	9340	4968	5154	46107	48180
1979	11060	18339	**	**	11418	10341	54485	49149

* = Data confidential, less than three plants or corporations; ** = Data unavailable.

Note: Figures for output and revenue include data for both intermediate and finished products so some double counting is present.

Source: NMFS Processed Products Survey, December 1980.

While total processed production grew significantly, from \$50.3 million in 1970 to \$157.4 million in 1979, a 213% increase, the rate was uneven for the various finished product groups. Table 28 shows that breaded products, cooked or raw, exhibited the greatest annual compound growth rates, in either undeflated or deflated terms. The growth of these two product lines and the fact that they command the highest product prices per pound, greatly underscores the industry's need for a steady but growing supply of large

surf clams, since these products can only be made from large surf clam meats.

Table 28. Relative Compound Growth Rates of Undeformed and Deformed Value of Production for Clam Based Finished Products

<u>Product</u>	<u>Undeformed</u>	<u>Deformed</u>
Canned Chowder (1970-1979)	9.2%	0.5%
Canned Minced Clams (1970-1979)	10.3	1.7
Frozen Breaded Cooked Clams (1970-1979)	23.9	15.3
Frozen Breaded Raw Clams (1970-1978)	26.4	16.3
Clam Juices (1970-1979)	16.6	8.0

Processing Sector Capacity

The 1979 surf clam and ocean quahog quotas were harvested. Preliminary data indicate that the 1980 surf clam catch was approximately 3.4 million bushels and the ocean quahog catch was approximately 2.9 million bushels, totalling 6.3 million bushels. The 5 processing plants that left the industry in 1979 had no apparent significant impact on processing capacity, since total landings increased by approximately 7.3 million pounds from 1978 to 1979. Since there has been no significant indication of change in the processing sector since Amendment #2, it seems reasonable to conclude that processing capacity is at least equal to the quotas for surf clams and ocean quahogs proposed in this Amendment.

IX-3. International Trade

Data are not available to identify international trade in surf clams and ocean quahogs.

X. DESCRIPTIONS OF THE BUSINESSES, MARKETS, AND ORGANIZATIONS ASSOCIATED WITH THE SURF CLAM AND OCEAN QUAHOG FISHERY

X-1. Relationship Among Harvesting and Processing Sectors

In this industry, fishermen enter into an agreement with a processor to sell him 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 process of vertical integration that is occurring within the industry. To the extent that increasing shares of the quota can be harvested by vessels owned or closely associated with processors, the independent vessels will have decreasing opportunities to participate in the fishery.

X-2. Fishery Cooperatives Or Associations

There are three active fishermen's cooperatives in the Mid-Atlantic area. Although some purchasing of expendable equipment for fishing vessels is undertaken, their main business is marketing members' landings. Cooperative operations are typical of Mid-Atlantic packing or dock practice, supplying fuel, ice, water, and trip services to members. All three cooperatives are located in New Jersey. The three cooperatives are the Belford Seafood Cooperative Association, Inc., the Point Pleasant Fishermen's Dock Cooperative, Inc., and the Cape May Fishery Cooperative.

X-3. Labor Organizations

Labor organizations identified with the harvesting and processing sectors of the fisheries in the Mid-Atlantic area are limited to four organizations: the Seafarers International Union of North America, the International Longshoremen's Association, the United Food and Commercial Workers International Union (UF & CW) of the AFL-CIO, and the International Brotherhood of Teamsters. The following discussion relates to Mid-Atlantic fisheries generally. Information is not available to identify activities that relate

directly to surf clams or ocean quahogs.

In the Mid-Atlantic area union involvement is almost entirely limited to onshore seafood handling, processing, and distribution activities. Vessel crews are not organized by any of the identified unions although some attempts have been made in the past to include fishermen in organized unions. The UF & CW recently attempted to organize vessel crews who were employees of a seafood processing company. Although their efforts were met favorably by the crew members, the National Labor Relations Board ruled that the UF & CW was in violation of labor law because each boat was owned by a separate owner and, therefore, all boat crews could not be organized under the same union. Since that ruling, the UF & CW has not attempted to organize vessel crews in any other locations.

Onshore seafood handling is generally non-unionized. To the extent that it is, the International Longshoremen's Association is the primary national union involved in seafood handling workers. Most union activity occurs in the region's major urban centers (New York, Philadelphia, Baltimore, and Norfolk) and includes handling workers at boat docks and in warehousing facilities located at processing plants.

Fish processing workers, when unionized, are represented by the UF & CW. This union represents oyster and clam shuckers, fish cleaners and cutters, freezermen, warehousemen, some distribution workers, and wholesale retail clerks.

Transportation of seafood products, especially from processing facilities to wholesale and retail fish distributors is organized under the International Brotherhood of Teamsters, with headquarters in Washington, D.C. and regional offices in major urban centers throughout the Mid-Atlantic region.

Preliminary analysis of labor union activity in the Mid-Atlantic region indicates that the seafood harvesting, handling, and processing industry is not highly organized. Although union activity occurs in all major urban centers, the overall percentage of union members employed in the seafood industry is relatively low. For example, in the Hampton Roads area, only five percent of all workers employed in the seafood harvesting and processing industry are organized by the unions.

The reasons for limited union involvement include the low-wage, seasonal nature of employment in the processing industry and the diverse, highly competitive, independent small businessman characteristics of fishermen, brokers, and processors. In many instances, wages are extremely low, approaching minimum wage in some localities. Often fish processing employees are the lowest paid employees covered by the unions. These employees, subject to difficult working conditions and unstable employment prospects, change employment continuously, leaving employers with no work and hiring on with companies that do have work. Seasonality of employment and constant changeover from shellfish to finfish processing affect steady employment and limits the unions' ability to organize on-shore workers.

Unionization of vessel crews and fishermen is limited by the small size of individual crews and the investor-owner fishing boats. National Labor Relations Board rulings against organization of fishing fleets have added to the organization and administrative problems of including fishermen in national union structures.

X-4. Foreign Investment In The Domestic Fishery

No significant foreign investment is known to exist in this fishery.

XI. DESCRIPTION OF SOCIAL AND CULTURAL FRAMEWORK OF DOMESTIC SURF CLAM AND OCEAN QUAHOG FISHERMEN AND THEIR COMMUNITIES

Uniform socio-economic data on fishing communities are not available. Certain information is available from the federal census on a county basis. Therefore, surf clam and ocean quahog landings were tabulated by county and analyzed to identify those counties with a significant involvement in these fisheries (Tables 9 and 10). Atlantic and Cape May, New Jersey, Northampton and Accomac, Virginia, and Worcester, Maryland, were selected as being relatively important. Data from the census are presented in Table 30. Data on fisheries employment are not available on the county level. The general condition of the economies of Northampton and Accomac Counties can be observed from Table 30, perhaps leading to the conclusion that stabilization of processing sector employment is an important consideration in this Amendment. Income levels in all of the counties is below the national median.

Table 29. Selected 1970 Population and Economic Characteristics for Counties with Significant Surf Clam and Ocean Quahog Landings

	US	Atlantic, NJ	Cape May, NJ	Northampton, VA	Worcester, MD	Accomac, VA
Population						
Total (000)	203,212	175	60	14	24	29
% Change, 60-70	13.3	8.8	22.7	-14.9	3.0	-5.3
% Net mig. 60-70	1.7	4.8	21.9	-21.5	-5.5	-9.4
% 18 yrs. & over	65.6	68.6	71.7	65.1	65.2	67.8
% 65 yrs. & over	9.9	16.3	20.0	14.3	12.9	15.5
Median age	28.3	35.5	38.9	33.7	31.9	35.0
Over 25, median school yrs. completed	12.1	11.2	11.3	9.2	10.2	9.5
Labor force						
Total (000)	82,049	70	21	6	10	11
Civilian (000)	80,051	69	20	6	10	11
% Fem. with husb.	57.0	51.6	54.8	56.6	60.1	59.7
% Unemployed	4.4	5.7	6.5	12.4	3.2	6.3
% Emp. in mfg.	25.9	16.5	11.4	14.9	22.3	23.7
% Emp. outside county	17.8	14.6	15.8	9.1	18.1	20.7
% Families/female head	10.8	14.7	10.1	15.4	11.9	13.3
Median family income	\$ 9,586	\$8,757	\$8,295	\$4,777	\$7,386	\$5,670
% Families low income	10.7	9.9	8.9	32.2	17.3	25.2
Mfg. estab.						
Total	311,140	248	52	17	50	56
% 20-99 emp.	24.3	27.4	26.9	17.6	34.0	10.7
% Total Retail Sales						
Eating & drinking places	7.7	16.4	19.6	4.8	12.2	5.1
% Selected Services Receipts						
Hotels, etc.	11.6	53.8	58.3	D	51.2	D
Amusements	13.7	20.9	18.1	D	27.3	D

D = Data not reported

Source: County and City Data Book, 1972.

XII. DETERMINATION OF OPTIMUM YIELD

XII-1. Specific Management Objectives

The objectives of the Plan are:

1. Rebuild the surf clam populations to allow eventual harvest approaching the 50 million pound level, which is the estimate of maximum sustainable yield over the range of the resource, based on the average yearly catch from 1960 to 1976.
2. Minimize economic dislocation to the extent possible consistent with objective 1 and encourage efficiency in the fishery.
3. Prevent the harvest of ocean quahogs from exceeding maximum sustainable yield and direct the fishery toward achieving Optimum Yield.
4. Provide the greatest degrees of freedom and flexibility to all harvesters of these resources consistent with the attainment of the other objectives of this Plan.
5. Optimize yield per recruit.
6. Increase understanding of the conditions of the stocks and fishery.

The management measures currently in the Plan are summarized in Section IV.

XII-2. Description of Alternatives

Alternatives for Amendment #3 are:

1. Take no action at this time.

This alternative would mean that the Plan would lapse on 31 December 1981 unless extended by a Secretarial Amendment. Lack of a plan could lead to overfishing and could have negative impacts on the harvesting and processing sectors.

2. Continue the provision to close areas with large numbers of small surf clams, impose a 5.5" surf clam size limit in both the Mid-Atlantic and New England Areas, continue annual and quarterly quotas, and continue the effort restrictions in the current Plan. The ocean quahog regime would be continued unchanged.

Except for the removal of the moratorium on entry of new vessels into the surf clam fishery and the addition of the surf clam size limit, this alternative is the same as the regime currently in effect pursuant to Amendment #2.

The annual surf clam Optimum Yield (quota) would be between 1.8 and 2.9 million bushels (Approximately 30 - 50 million pounds of meats) in the Mid-Atlantic Area and 25,000 bushels (approximately 425,000 pounds of meats) in the New England Area. The annual ocean quahog Optimum Yield (quota) would be between 4.0 and 6.0 million bushels (40 - 60 million pounds of meats). The Mid-Atlantic Area surf clam Optimum Yield range is bounded on the bottom by the current Optimum Yield and on the top by the estimated maximum sustainable yield. The ocean quahog Optimum Yield is bounded on the bottom by the current Optimum Yield and on the top by a quantity that, when added to the minimum surf clam Optimum Yield, would result in a combined Optimum Yield approximately equal to the maximum harvest reported (96 million pounds). The surf clam and ocean quahog Optimum Yields and quotas would be specified prior to the beginning of each year based on a review of the latest stock assessment and other relevant data by the Council and its Scientific and Statistical Committee and Surf Clam and Ocean Quahog Advisory Subpanel. A Plan Amendment would be required to increase or decrease the surf clam and ocean quahog Optimum Yields and quotas above or below the quantities specified.

The current Plan provides that areas may be closed if over 60% of the surf clams are less than 4.5" in length and less than 15% are over 5.5" in length. However, the Plan currently does not include specific criteria for reopening areas. It is proposed that the current closure criteria be continued and that the criteria for reopening be that a closed area or a portion of a closed area may be reopened to fishing when the average clam length in the dominant (in terms of weight) size class in the area to be reopened has reached 5.5" in length, if appropriate given all relevant biological, environmental, and economic considerations. In addition, it would be possible to selectively open portions of closed areas for short time periods to permit selective harvest of very dense beds for thinning purposes. The Council's Scientific and Statistical Committee would review available data and make a recommendation to the Council. The Council could also consult its Surf Clam and Ocean Quahog Advisory Subpanel. The Council would then make a recommendation to the Regional Director. The Regional Director would be required to hold a public hearing on the reopening before making a final decision. Reopening decisions would be made so that the anticipated yield from the reopened area could be accounted for in the development of the annual Optimum Yield and quota.

The 5.5" size limit for surf clams is proposed in order to optimize the yield from the resource. Offshore surf clams grow rapidly to about that size, following which growth is relatively slow. They generally reach that size in about six to seven years. That size would permit the clams to spawn several times prior to harvest, thus increasing the chances of successful future sets. While essentially all sizes of clams can be used for chowders, juices, and related product lines, clams of about 5.5" are needed to produce strips. Therefore, the size limit will enhance the biological objectives of the Plan while ensuring that all sectors of the industry are assured an adequate raw material supply. The size limit would not reduce supplies available for products other than strips, since 5.5" clams can be used for the other product lines. The size limit would also protect small clams in areas that have not been and perhaps cannot be closed. It should facilitate the reopening of closed areas by offering protection to small clams in such areas even though there are enough large clams in such areas to justify reopening.

3. Remove effort restrictions.

This is a modification of alternative 2. The surf clam and ocean quahog quotas would be set as described under alternative 2. Areas could be closed and reopened as discussed under alternative 2. There would be a 5.5" surf clam minimum size limit as discussed in alternative 2. However, there would be no mandatory effort restrictions in the surf clam fishery. That is, fishing for surf clams would be permitted 7 days a week, 24 hours per day, with no adjustments to enable quarterly quotas to last throughout a quarter.

4. Revise the fishing week, bad weather make-up day, and effort restrictions.

This is a modification of alternative 2. The process for setting annual surf clam and ocean quahog quotas, the provisions to close and reopen areas, and the 5.5" surf clam size limit would be the same as in alternative 2. The fishing week would be changed from 5:00 pm Sunday - 5:00 pm Thursday to 6:00 am Sunday - 6:00 pm Thursday. Fishing periods would end at 6:00 pm each day. The starting times would vary depending on the fishing hours of the vessel, but in no event could a vessel begin fishing prior to 6:00 am Sunday. The bad weather make-up day provision would be in effect during November, December, January, February, March, and April. There would be equal quarterly quotas.

The redefinition of the fishing week would mean that surf clams could be harvested on Sunday, thus permitting the processing plants to begin work on Monday. The starting time is limited to 6:00 am Sunday in order to lessen enforcement costs.

The effort restrictions would be revised slightly to provide that the Regional Director could regulate the maximum weekly surf clam fishing hours as necessary to minimize the chances of a closure during any quarter while minimizing the number of changes to the effort restrictions during any quarter. The Plan currently requires that each quarter begins with no more than 24 hours per week. There have been occasions when fishing hours have been increased to a larger number. Under the current regulations, if the number of hours is greater than 24 at the end of a quarter, the hours must be reduced to 24 on the first day of the new quarter, even though estimates of catch rates indicate that a rate greater than 24 hours would be reasonable. Then, as soon as the new quarter begins, the rate may be raised to whatever seems appropriate. At the very least this requirement has created the potential for needless administrative costs.

5. Institute a permit limitation system in the surf clam fishery.

This is a modification of alternative 2. The process for setting annual surf clam and ocean quahog quotas, the procedures for closing and reopening areas, and the 5.5" surf clam size limit would be the same as in alternative 2. It would apply only in the Mid-Atlantic Area. To these measures, alternative 5 would add an entry limitation system to replace the moratorium currently in effect in the Mid-Atlantic surf clam fishery. Entry would be limited by limiting the number of permits that could be issued to harvest surf clams (either surf clam-only permits or permits for surf clams and ocean quahogs combined) in the Mid-Atlantic Area. For public hearing purposes, the Council developed two separate alternatives for limiting permits in the surf clam fishery. Alternative 5a would reduce the maximum number of permits that could be issued through a five year process. Alternative 5b would change the maximum number of permits in response to changes in Optimum Yield (quotas).

Both alternatives 5a and 5b include a requirement that vessels harvest a specified amount of FCZ clams in order to maintain a permit. The requirement can be met by either FCZ surf clams or ocean quahogs in order to permit vessels that were issued permits for surf clams and ocean quahogs, as well as for just surf clams, under the moratorium to maintain their surf clam permit eligibility under the new limitation system. There are a number of vessels that were in the surf clam fishery prior to the moratorium that have entered the ocean quahog fishery to a significant degree. These vessels have permits for both fisheries. To require that these vessels harvest surf clams to maintain their eligibility would impose a hardship on them and would also result in those vessels taking a portion of the surf clam quota that they would not otherwise take. However, it is appropriate that provision be made for those vessels to maintain their eligibility in the surf clam fishery under an entry limitation system. In other words, these vessels established historic participation in the surf clam fishery by qualifying for permits under the moratorium. They entered the ocean quahog fishery and contributed to the attainment of the Plan's objective relative to that fishery. Therefore, they should not be penalized by losing their surf clam permit eligibility under the new entry limitation system nor should they be required to catch a specific number of surf clams to

maintain that eligibility if they chose to fish for ocean quahogs. However, this requirement is not intended to permit vessels that have permits to fish only for ocean quahogs to establish eligibility for a Mid-Atlantic Area surf clam permit by harvesting Mid-Atlantic Area ocean quahogs.

5a. Reduce the maximum number of Mid-Atlantic Area surf clam permits.

At current levels of Optimum Yield and demand, it is likely that ex-vessel prices will remain at levels that will cause vessels currently in the fishery to leave and not encourage new vessels to enter the fishery, thus bringing harvesting capacity more in line with likely quotas. However, there is always a possibility of a recruitment failure or other factors that would result in higher prices and consequent entry of large numbers of new vessels, in effect replicating the situation that created the need for the initial moratorium in 1977. The object of this alternative is to allow new participants in the fishery, within limits, while removing the possibility of a large increase in the number of vessels in the fishery in response to a short term crisis. In order to keep a permit, a vessel would need to land 2,500 bushels of FCZ clams (i.e., surf clams or ocean quahogs) annually. If that minimum were not met, the permit would be withdrawn by NMFS. For every 4 permits withdrawn, a new permit could be issued. NMFS would maintain a waiting list of persons desiring permits. Fishermen who lost permits could reapply, but would go on the bottom of the list, thus eliminating the possibility that those who do not intend to participate can keep permits away from those that do want to participate.

The process of reducing the number of permits (1 issued for every 4 reverted) would continue for 5 years, following which the annual total number of permits would be limited to the total number of issued permits in the fifth year.

Permits would be transferable, so that if a vessel with a permit were sold, and if the seller no longer wanted the permit and the purchaser did want the permit, it would be automatically transferred. This would allow for the common practice of selling one's capital equipment and business as a planned part of retirement or business change. If a vessel owner with a permit wanted to sell the vessel but retain the permit for use with a new surf clam vessel, he could do so, but the vessel that was sold would not be eligible for a surf clam permit unless it qualified as a new entrant. However, a permit could not be sold by itself because the Council feels it is not appropriate for permits to become essentially marketable securities. In addition, the sale of a vessel and permit would not change the need for the vessel to catch 2,500 bushels during the year. In other words, the sale of an unqualified vessel (one that had not caught 2,500 bushels during the year) late in the year would not be justification for NMFS not withdrawing the permit from the purchaser.

5b. Change the number of permits issuable in response to changes in Optimum Yield.

This alternative would establish a ceiling on the number of surf clam permits that could be issued in any year. Valid permits issued pursuant to the moratorium on entry of vessels in the Mid-Atlantic Area surf clam fishery would be valid in 1982. In order to retain a permit, it would be necessary for a vessel to harvest 8,000 bushels of FCZ clams (FCZ surf clams or ocean quahogs) annually. The total number of permits that could be issued in any subsequent year could be increased or decreased by 5 for every 5% increase or decrease, respectively, in the Optimum Yield. No vessel could have its permit revoked, in the event of a reduction, if it met the 8,000 bushel criterion.

6. Create two Mid-Atlantic surf clam management areas.

This is a modification of alternative 2. It is designed to distribute catches more evenly among resource areas and control the impacts of the reopening of closed areas on the harvesting and processing sectors. The dividing line would be loran line 9960-Y-42650, extending eastward from the mouth of Delaware Bay. Areas north and south of that line would have separate quotas and harvesting would be regulated by different effort limitations, if necessary, in each area. Quotas for the areas north and south of the dividing line would be based primarily on relative resource abundance and historical and relative exploitation rates in each of the areas. Prior to each quarter, vessel operators would notify NMFS the area in which they wanted to fish during the upcoming quarter, and this designation could not be changed during the quarter. As a result of this system, if an area were reopened to surf clamming and the area had clams of a very high density so that, in the absence of this provision, the quarterly quota could be harvested in a relatively short period of time, vessels that did not have ready access to the reopened area would not be closed out of participating in the fishery during the quarter.

7. Create separate management areas for reopened surf clam areas.

This alternative is a modification of alternatives 2 and 8. It is designed to address some of the same problems as alternative 6. Prior to the beginning of each year, areas to be reopened would be identified, estimates of the allowable catch from each area would be made, a reopening date would be established, and a time period during which the allowable catch could be harvested would be specified. The overall quota for the fishery as selected from the Optimum Yield range will account for allowable catches from reopened areas, that is, the allowable catch from reopened areas plus the allowable catch from the remainder would equal the quota for the year. In specifying the time period over which the catch is to be taken, the guiding principle will be that the catch from the reopened area will have the least possible negative impact on the general fishery. Each reopened area would have appropriate effort restrictions to ensure that the harvest from the area would not be so rapid so as to harm the long-term harvest from the area and to insure that the catch was spread as evenly as possible throughout the time period that the area is to be opened. These special conditions would continue until the catch per unit of effort in the reopened area was comparable to the catch per unit of effort outside the reopened area. If the catch per unit of effort in the reopened area reached the general level of the fishery outside the reopened area before the estimated catch from the area was harvested, the remaining catch would be added to the overall fishery quota and the special effort limitations would be removed. If the estimated catch from the reopened area was taken or the end of the time period was reached before the catch per unit of effort dropped to the general level, the area would be closed for the year. Vessel operators would be required to inform NMFS in advance of their desire to fish in these areas. Special enforcement efforts would be required in these areas to minimize violations. These special efforts could include embarking enforcement officers on vessels fishing in the areas or requiring that vessels fishing in these areas be equipped with transponders so that necessary monitoring and enforcement could take place more effectively.

This alternative would also include a revision to the effort limitations to permit the Regional Director to set fishing times as necessary to permit harvesting throughout the predetermined time period (i.e., hours per week, hours per month, or hours per quarter) rather than just regulating hours per week. This is necessary because catch rates in reopened areas may be so high so as to make fishing periods too short if only hours per week were regulated. It is possible that a large number of vessels may choose to fish in these areas on the first day that an area is opened, particularly if regulation is in the form of hours per month or hours per quarter. It is also likely that reopened areas may be quite small, and that, in fact, subsections of reopened areas may be opened on a phased basis to facilitate enforcement. These factors could lead to an excessive number of vessels attempting to fish in a small area at one time, creating safety problems and perhaps resulting in damage to the resource. If these problems develop, NMFS may designate the maximum number of vessels that may fish in an area at any one time and, if conflicts develop between that number and the fishing periods requested by fishermen, NMFS may select the vessels that fish on particular days by use of a lottery.

It is recognized that the system created by this alternative will require substantial effort for both assessments and monitoring. However, the Council believes that it is important that fishermen know at the beginning of each year the quantities of clams that may be taken from the reopened areas and from the fishery generally so that they may rationally plan their fishing strategies. It is also important that fishing levels in the reopened areas be managed so that possible large catches in reopened areas not lead to effort limit reductions or closures in the general fishery, and that negative impacts on fishermen who do not have ready access to reopened areas are minimized to the greatest extent possible.

8. Continue the provision to close areas with small surf clams, impose a 5.5" surf clam size limit, continue annual quotas, and institute a vessel allocation system in the surf clam fishery.

Under this system, each vessel in the fleet would be allocated a share of the overall annual quota. It would apply only to the Mid-Atlantic Area. The allocations would be established on a percentage basis so that the value of the allocation would vary as the size of the quota varies from year to year. The initial distribution would be based 20% on vessel characteristics and 80% on the share of the overall quota harvested by the vessel, as reported in logbooks, during 1978, 1979, and 1980. Only vessels with valid permits in the Mid-Atlantic surf clam fishery on 1 October 1981 would be eligible for allocations. The cut-off date is needed in order for the allocation calculations to be made prior to the beginning of 1982, when the allocations would become effective. In order to remain in the fishery, a vessel with an allocation would be required to harvest its allocation or 2,500 bushels, whichever is less, during any year.

If this criterion was not met, the permit and allocation would revert to the NMFS and could be reallocated to a new entrant to the fishery. If there were no new entrants the permit could be retired and the allocation be distributed to the remaining participants in the fishery in proportion to the outstanding allocations. Allocations to a new entrant for any one year would equal the average of the allocations reverted during the year, but could not exceed 15,000 bushels. However, there could be no new entrants until every existing permit holder who had an allocation of less than 15,000 bushels and wanted his allocation increased to 15,000 bushels, had his allocation increased to that level. Any surplus allocation remaining after allocations had been made to new entrants would be allocated to existing participants in the fishery in proportion to the outstanding allocations.

An operator with more than one vessel and allocation could assign allocations to one vessel. In this case, the permit(s) for the vessel(s) from which the allocation(s) was taken would revert to NMFS and be retired.

Vessels with their allocations would be freely transferable, but allocations themselves could not be sold. Vessels could be sold without their permits and allocations if the owner wanted to acquire a new vessel. A new fisherman would not be prohibited from entering the fishery, but would have to purchase his vessel and allocation from existing participants or wait to get a permit and an allocation from NMFS in order to do so.

9. Continue the provision to close areas with large numbers of small surf clams and impose a 5.5" surf clam size limit. The ocean quahog regime would continue unchanged.

This alternative would remove annual and quarterly quotas and effort restrictions from the surf clam management regime. The Optimum Yield for surf clams would be all surf clams caught by US fishermen. Harvesting surf clams less than 5.5" would be prohibited, as in alternative 2. The procedures to close and open areas with concentrations of small surf clams would be the same as those in alternative 2.

The ocean quahog management regime would continue essentially unchanged, with the annual Optimum Yield, Domestic Annual Harvest, Domestic Annual Processing, and quota set as outlined under alternative 2.

Summary of Alternatives

The following table summarizes the alternatives. It must be noted that, following public hearings, it may be appropriate to select a final alternative that includes only portions of the alternatives as defined or to rearrange management measures differently than described above. Additional combinations of measures might be appropriate based on comments made during the review of this Amendment and will be considered by the Council prior to final adoption of this Amendment.

	Alternative								
	1	2	3	4	5	6	7	8	9
Free entry (surf clam fishery)	X	X	X	X	-	X	X	-	X
Free entry (ocean quahog fishery)	X	X	X	X	X	X	X	X	X
Limited entry (surf clam fishery)					X			X	
Surf clam size limit		X	X	X	X	X	X	X	X
Surf clam area closures		X	X	X	X	X	X	X	X
Effort restrictions		X	X	X	X	X	X		
Annual quotas		X	X	X	X	X	X	X	X ¹
Quarterly quotas		X	X	X	X	X	X		X ²
New England Area (surf clams)		X	X	X	X	X	X	X	
Permits		X	X	X	X	X	X	X	X
Logbooks		X	X	X	X	X	X	X	X

1 Ocean quahogs only.

2 Ocean quahogs only, if it became necessary.

XII-3. Analysis of Beneficial and Adverse Impacts of Potential Management Options

Introduction

This amendment includes 9 alternatives which can be subdivided into the following categories: alternatives that address the setting of an annual quota (alternatives 1, 2, and 9); alternatives that address effort restrictions and access control; and alternatives that address specific biological problems. Each of these alternatives may stand alone as amendments or they may be combined with other alternatives into the recommended management alternatives.

These alternatives will be discussed in order of their sequence and, where important, contrasted to the existing plan or previously discussed alternatives. Each alternative will be discussed according to its conservation and environmental impacts, economic efficiency impacts, management impacts, and distributional impacts. The distributional impact discussion of each alternative will attempt, where possible, to assess the impacts on the consumer, the harvester, and the processor.

Alternative 1: Take no action at this time.

Conservation and Environmental Impacts

An unregulated surf clam fishery would result in overfishing and a reduction in surf clam stocks which would increase the probability of a recruitment failure. Additionally, lack of regulation would result in highly intensive dredging of the most densely populated clam beds. Fishermen have observed that such intensive dredging usually is accompanied by the death of all of the unharvested clams in a bed, presumably as a result of bacterial action from the decomposition of the higher-than-normal numbers of clams killed (but not removed) during the dredging. Any management measures which limit the duration and intensity of dredging (including bad weather make-up day and limited entry) should reduce incidental clam mortality, and lack of such regulation could lead to a significant reduction in long-term yield from the resource.

While the ocean quahog fishery has been unregulated, except for annual quotas, this fishery cannot be readily compared to the surf clam fishery. It is a new and developing fishery. If certain economic variables dramatically change, such as an increase in the ex-vessel prices of surf clams or ocean quahogs, then the potential for overfishing will occur and the quahog fishery may suffer the same environmental and conservation impacts that the surf clam fishery has in the recent past.

Economic Impacts

It has been shown theoretically and historically that an unregulated fishery will lead to overcapitalization of the industry and will have the symptoms of too much employment at the harvesting level and decreased employment and increased prices at all other levels of operation: processor, wholesaler, retailer, and consumer. Furthermore, any increase in the product price or stock abundance will induce new entrants into the harvesting sector. Unfortunately, fishermen are eager to enter into an expanding fishery but reluctant to leave a declining fishery, thus compounding management problems. This problem is accentuated by the fact that many of the ocean quahog vessels are also licensed in the surf clam fishery. Therefore, they can redirect their efforts to surf clams if the economics (harvesting cost vs. price) of harvesting surf clams is more attractive than the economics of harvesting ocean quahogs. While the ocean quahog resource is very large, it is distributed over a wide range. The fishery so far has been carried out in relatively confined areas off southern New Jersey and Delmarva. The surf clam resource is rebuilding in several areas, most especially off southern New Jersey (off Atlantic City). It is, therefore, not unlikely that in the near future, in the absence of controls, some of the effort currently going into quahogs would be redirected to surf clams. This is of great concern to the surf clam industry since such a redirection of effort could result in the quahog vessels harvesting significant shares of the surf clam quota, possibly reducing the supply of surf clams for the strip market.

The consumer is strongly affected by overfishing in an unregulated fishery in two ways. First, he loses the availability of the goods and services that could have been produced had the raw materials contained in the unnecessary extra fishing effort been channeled elsewhere in the economy. Secondly, the consumer loses the availability of clam products because of the reduced harvests while paying a higher price than necessary for the existing clam products.

In the short run, if the fishery is unregulated, the existence of profits will cause an increase in harvesting capacity. As this capacity is used, increasing quantities of clams will be landed, causing ex-vessel prices to fall. In the long run, unit harvesting costs will rise as fishermen spend increasing amounts of time searching for the increasingly scarce resource. Ex-vessel prices will also increase as the resource gets scarce, but, with lower total catches and higher unit costs, an increasing number of vessels and fishermen will find it uneconomic to fish and will leave the fishery. Since processors tend to buy from their own vessels before purchasing from independent vessels, independents will be negatively impacted and probably will be the first vessels to leave the fishery. This statement is supported by the fact that in 1978, the top four processing firms owned 44 vessels collectively. These vessels generated 32% of all the industry's harvest revenues from the FCZ surf clam, ocean quahog, and inshore surf clam fisheries combined. However, it is unclear whether independent boats, as a class, are more or less efficient than processor owned boats.

At the processor level, the distributional effects will depend on what processors remain in the industry after a number of years of overfishing. With no regulation on minimum clam size, breaded strip processors will be negatively impacted by the amount of small clams that could potentially grow into large clams that are ground up for chowder and other products.

Temporarily, if overfishing causes a surplus amount of clams to be landed, those processors who buy from independently owned vessels may be positively impacted relative to processors with their own fleet. Ex-vessel prices will fall such that non-fleet owning processors will benefit while fleet owning processors will find their vessels less profitable to operate. However, as the stock declines, this situation should reverse as fleet owning processors will be more able to guarantee a steady supply of raw product to their plants while their counterparts will be paying higher prices to the independent boats.

Management Impacts

There is no management under this alternative, so there are no management costs.

Alternative #2: Continue the provision to close areas with large areas of small surf clams, impose a 5.5" surf clam size limit in both the Mid-Atlantic and New England Areas, continue annual and quarterly quotas, and continue the effort restrictions in the current Plan. The ocean quahog regime would be continued unchanged.

Conservation and Environmental Impacts

The stock depletion effects of overfishing are prevented by this alternative by the setting of an annual quota. The effort restrictions in parallel with the quarterly quotas will help spread the rate of harvest throughout the year. That is, instead of exposing the surf clam stocks to periods of high and low harvesting mortality, quarterly quotas and the effort restrictions result in relatively constant levels of harvesting mortality. The closure provision also reduces the rapid depletion of specific beds and prevents damage that may occur from unrestrained dredging. The 5.5" size limit should have the beneficial effects of allowing yield per recruit to increase relative to harvesting at the smallest size now being taken (about 3") and enhancing the probability of future recruitment through increased spawning. It seems reasonable to assume there will be 30 million pounds of 5.5" clams; that is, that the 5.5" size limit will not constrain the capture of the quota, since the mean size of harvested commercial clams is between 6.1" -6.8". Further, the size limit should remove the possible harvesting of small clams in very dense beds that may not be protected by an area closure, an activity that occurred during 1980.

Removal of entry limitations in the Mid-Atlantic Area surf clam fishery could have negative impacts to the extent that, if significant additional vessels enter the fishery and if, as is quite likely, there are relatively insignificant quota increases, there would be increased dredge mortality. Dredge mortality impact was one of the reasons for imposing the moratorium on entry of vessels into the fishery.

Economic Impacts

Except for the removal of entry limitations, and, perhaps, the imposition of the surf clam size limit, this alternative should have no economic impacts different from those of the current Plan. The minimum quota levels proposed are equal to those currently in effect. The alternative does provide for quota increases without the need for Plan amendments, but the impacts of this provision are essentially

administrative and should produce cost savings to both industry and government by lowering the time and effort needed to keep the Plan current over time.

The existence of the quotas allows the industry to plan employment, investment, and harvesting decisions. The annual quota, when coupled with the quarterly quota and effort restrictions, stabilizes the industry at both harvesting and processing levels throughout the year.

The 5.5" size limit for surf clams is proposed to optimize the yield from the resource. Essentially, all sizes of clams can be used for chowders, juices, and related product lines. However, larger clams (5.5" and larger) are needed to produce strips, which are not only the fastest growing product line, but on a unit basis, the highest valued product. This size limit will only have a negative economic efficiency impact if processing costs to the non-strip processors increase relative to any decrease in processing costs of the strip processors. This is unlikely because non-strip processors can use 5.5" clams, and approximately one-half of the meat weight of clams used for strips is used for other clam products. As noted above, the 5.5" limit is lower than the average size of clams harvested. In addition, ocean quahogs, in many cases, are substitutable for surf clams for products that do not use strips. The size limit will insure supplies of clams for all product lines. Recent experience has shown that, if dense areas of small clams are discovered in areas that are not closed, harvesting costs may be low (relative to the cost of harvesting ocean quahogs for which they are a substitute) so the small clams will be harvested. While this may result in short-term benefits to those involved in the activity, the long-term impacts are negative, both for spawning reasons and because the clams are not available for the more valuable strip market. By permitting the clams to reach a size so they can be used for all products, all participants, including consumers, benefit.

The removal of entry limitations could be significant if significant numbers of vessels enter the Mid-Atlantic surf clam fishery. As of 31 December 1980, there were 167 vessels with permits for the Mid-Atlantic Area surf clam fishery, 110 with permits for the New England Area surf clam fishery, and 63 with permits for quahogs only. There were only 143 vessels active in the Mid-Atlantic Area fishery in 1979. If entry limitations were removed, the vessels with New England only permits and ocean quahog only permits, as well as vessels not yet permitted, could enter the Mid-Atlantic surf clam fishery. While it is impossible to estimate the number of vessels that might enter the fishery, given the likely assumption that quotas will not increase significantly, any additional vessels will result in the available quota being harvested by more vessels than are currently operating.

Without estimates of the final demand for surf clam-ocean quahog products, the effects of alternative 2 on the consumer can only be quantitatively stated based on the assumption that the demand for these products is stable. Consumer impacts should be no different than those of the current Plan.

Management Impacts

Relative to the current Plan, the size limit would increase enforcement costs. Entry of additional vessels would increase enforcement and administrative costs.

Alternative 3: Remove effort restrictions.

Conservation and Environmental Impacts

If no effort restrictions lead to highly intensive dredging, then these impacts will be more severe than alternative 2. If they do not, these impacts would be the same as those of alternative 2.

Economic Impacts

At the present time, it is unclear which vessel class is the most profitable or efficient. Many of the Class 3 vessels have superior harvesting capacities relative to the rest of the fleet, but, many of these same vessels are recently constructed and therefore have high mortgage and insurance costs and also probably use proportionally more fuel relative to the smaller classes. These considerations must be taken into account before the impacts of this alternative can be analyzed.

Since the same quotas will be caught under alternatives 2 and 3, the consumer impacts should be similar to the ones discussed in alternative 2.

Two likely distributional impacts on the harvesting sector seem evident in comparison with alternative 2. The first will probably be an increased shift in the share of total revenues from Class 2 vessels to Class 3 vessels. The revenue share of Class 2 vessels fell 10% for the period 1978 to 1979 while the Class 3 share increased by the same amount (see Table 14). With no effort restrictions, this shift in total industry revenue share will become more pronounced. The second will probably be a declining share of total catch and revenues by the independent vessels as processors will have relatively few constraints in using their own vessels to meet their raw product demand.

Management Impacts

When compared to alternative 2, the management burden will be reduced in that there would be no need of enforcing effort restrictions.

Alternative 4: Revise the fishing week, bad weather make-up day, and effort restrictions.

Conservation and Environmental Impacts

These impacts would be essentially the same as those of alternative 2. There would tend to be a more positive impact with this alternative relative to alternative 2 since the two additional months of the bad weather make-up day should lead to less destruction of clams through dredging in rough seas when it is difficult to keep the dredge on the bottom.

Economic Impacts

The effort restrictions should have impacts similar to the ones discussed under alternative 2. The extension on the bad weather day coupled with equal quarterly quotas would allow vessels greater flexibility to catch the quotas during the time of the year when the market is most favorable. Traditionally, the surf clam market has been weak during the summer and strongest during the winter. Since implementation of the Plan, with higher quarterly quotas in the spring and summer, there have been times when these higher quotas were not harvested because of a lack of demand. Providing a bad weather make-up day during April and November in addition to December, January, February, and March will result in additional opportunities for vessels to fish when demand is relatively high.

The expansion of the fishing week to 4½ days, which would allow processors to expand their work week to 5 days, is economically efficient. Under this alternative, processors will not only be able to utilize more fully their plants and equipment but will also reduce their need for overtime employment. It is not possible to estimate possible changes in overtime pay.

Management Impacts

The only extra management burden of this alternative in comparison with alternative 2 is the enforcement of a bad weather day for an additional two months and the extra enforcement needed for the expanded fishing week, which is only 12 more hours than the existing fishing week.

Alternative 5a: Reduce the maximum number of Mid-Atlantic Area surf clam permits.

Conservation and Environmental Impacts

Relative to the existing Plan, the only foreseeable impacts this alternative would have, given the annual quota, is the potential for reducing the number of harvesters and thus reducing dredge mortality impacts on the beds. This consideration is especially important relative to reopened areas, where densities are likely to be high, and, consequently, the impact of dredge mortality greater.

Economic Impacts

A permit system is seen as a necessary replacement for the moratorium. Without it there is no control over the number of vessels harvesting the resource. Without it, as long as profits can be made by a new entrant without regard to overall impacts on the industry and society, even with the existing effort constraints, the potential for new entrants will exist.

Permit holders may modify the capacity of or replace their vessels. New vessels entering the fishery may have a greater capacity to harvest than the ones they replace.

Initially, permits will have a low value because an applicant can wait to get a permit from NMFS. It is reported that many vessels are for sale, which indicate that permits will initially have a low value. After the fifth year, the value of the permit will be a function of the existing profits of the industry as well as an applicant's forecast of the future profitability of the fishery. No quantitative analysis has been done on the future value of a permit. In addition to the conservation benefits of limiting entry, a major purpose of the permit system is not to limit harvesting capacity but to prevent the rush of new entrants into the fishery as was experienced in 1974-1976. The permit system is envisioned to provide for an orderly flow of new capital and labor to the fishery.

The economic impact of the 2,500 bushel per year license requirement would not be severe. Preliminary estimates of the amount of time it would take a vessel in each class to catch the license requirement, based on average 1979 catch rates for FCZ surf clams, are approximately 13 twelve hour periods for a Class 1 vessel, 10 twelve hour periods for a Class 2 vessel and 6 twelve hour periods for a Class 3 vessel. Based on average 1979 catch rates for ocean quahogs, the 12 hour time periods would be: 4 for Class 1, 3 for Class 2, and 1 for Class 3. In areas with higher than normal catch rates, it would take even less time to meet this requirement. At \$10.00 per bushel, 2,500 bushels would generate only \$25,000 in gross revenues, about 1/3 of which would be the crew share.

The only vessel group that may be negatively impacted are those marginal vessels who do not catch 2,500 bushels per year. Of the total 164 permitted surf clam vessels, 123 actually landed surf clams or ocean quahogs in 1980. 122 vessels would have had permits in 1980 if they had been required to take at least 2,500 bushels of surf clams or ocean quahogs in 1979 to retain their permits. With the 2,500 bushel criterion, one-fourth of 42, or 10 new permits would have been available, giving a potential fleet size of 132 vessels, or 10 more than actually fished in 1980.

The impacts on the consumer and processing sectors should be similar to the impacts discussed under alternative 2, except that, to the extent that any reduction in the number of harvesters results in lower unit harvesting costs and resulting lower ex-vessel prices, retail prices may decline as well.

Management Impacts

Relative to alternative 2, this alternative adds the annual issuance of surf clam permits to the set of management responsibilities.

Alternative 5b: Change the number of permits issuable in response to changes in Optimum Yield.

Conservation and Environmental Impacts

Relative to the existing Plan, the only foreseeable impacts this alternative would have, given the annual quota, is the potential for reducing the number of harvesters and thus reducing dredge mortality impacts on the beds.

Economic Impacts

A permit system is seen as a necessary replacement for the moratorium. Without it there is no control over the number of vessels harvesting the resource. Without it, as long as profits can be made by a new entrant without regard to overall impacts on the industry and society, even with the existing effort constraints, the potential for new entrants will exist.

Permit holders will be able to modify capacity of their vessel or completely replace the vessel. New vessels entering the fishery, under the permit transfer system, may have a greater capacity to harvest than the ones they replace.

Although permits can be sold, permit values should be low because the permit applicant can wait to get a permit from NMFS. It is reported that many vessels are available for sale, which indicates that the permit will initially have a low value. The number of issuable permits would be relatively large in the absence of significant quota reductions. Given the 8,000 bushel annual landing criterion, it is likely that

significant numbers of permits would not be reissued and would, therefore, be available for new entrants. However, the main purpose of the permit system is not to limit harvesting capacity but to prevent the rush of new entrants into the fishery as was experienced in 1974-1976. The permit system is envisioned to provide for an orderly flow of new capital and labor to the fishery.

The economic impact of the 8,000 bushel per year license requirement could be significant. Preliminary estimates of the amount of time it would take a vessel in each class to catch the license requirement, based on 1979 average catch rates for FCZ surf clams, are approximately 41 twelve hour periods for a Class 1 vessel, 32 twelve hour periods for a Class 2 vessel, and 24 twelve hour periods for a Class 3 vessel. Using the average 1979 catch rates for ocean quahogs, the 12 hour time periods would be 12 for Class 1, 11 for Class 2, and 6 for Class 3. In areas with higher than normal catch rates, it would take less time to meet this requirement. At \$10.00 per bushel, 8,000 bushels would generate \$80,000 in gross revenues, about 1/3 of which would be the crew share. Furthermore, 81 vessels fishing in 1979 did not catch 8,000 bushels of surf clams, 37 of which caught more than 2,500 bushels.

The impacts on the consumer and processing sectors should be similar to the impacts discussed under alternative 2, except that, to the extent that any reduction in the number of harvesters results in lower unit harvesting costs and resulting lower ex-vessel prices, retail prices may decline as well.

Management Impacts

Relative to alternative 2, this alternative adds the annual issuance of surf clam permits to the set of management responsibilities.

Alternative 6: Create two Mid-Atlantic surf clam areas.

Conservation and Environmental Impacts

This alternative is designed to distribute catches more evenly in relation to resource abundance among the resource areas and to minimize the distributional effects of reopening the closed areas. To the extent that this is performed, positive impacts will be generated. Also, the impacts of highly intensive dredging would be limited.

Economic Impacts

This alternative would reduce distributional impacts associated with reopening closed areas. It is assumed that reopened areas will have high densities so that quarterly quotas could be harvested in relatively short time periods, leading to very short fishing periods and/or closures. Vessels that do not have access to these areas would be negatively impacted since their unit harvesting costs would be higher than those vessels with access and probably short fishing times would lead to low catches in low density areas.

Without creation of separate surf clam management areas, vessels based far from reopened areas are at a disadvantage, with small vessels at the greatest disadvantage. With the management areas, positive impacts would accrue to those operators who choose to stay in the management area south of Delaware Bay. These vessels would compete with fewer boats in harvesting the area quota, however, they may be negatively impacted by any price decreases caused by the reopening of closed areas.

Management Impacts

This alternative would add greatly to management responsibilities because area quotas would have to be enforced and vessels kept within their areas.

Alternative 7: Create separate management areas for reopened surf clam areas.

Conservation and Environmental Impacts

This alternative will have the same conservation and environmental impacts as alternative 6. However, this alternative would enhance these impacts by leading to the most appropriate limitations for each reopened area. This should control damage to the beds from highly intensive dredging.

Economic Impacts

These impacts would be more positive than either alternative 2 or 6, since separate allowable catches and effort limits for the reopened areas would tend to reduce the impacts associated with the potential higher catch rates in the reopened areas relative to the fishery generally.

Management Impacts

Enforcement costs would probably be higher with this alternative than with alternatives 2 or 6 because of the need to carefully monitor activities in the reopened areas and to prepare reasonably precise assessments. However, it is likely that the benefits to the fishery from this alternative will outweigh these costs.

Alternative 8: Continue the provision to close areas with small surf clams, impose a 5.5" size limit, continue annual quotas, and institute a vessel allocation system in the surf clam fishery.

Conservation and Environmental Impacts

These impacts should generally be the same as those of alternative 2, since the annual quota, size limit, and area closure provision would be the same. There would be a positive impact relative to alternative 2 since entry would be limited, so that the potential of damage to the beds from highly intensive dredging would be less with this alternative than with alternative 2.

Economic Impacts

Direct allocations would guarantee all the vessels some share of the quota. They would also eliminate the need to regulate hours, which would eliminate the inefficiencies of the current regime (equipment combinations designed to maximize catch per unit of time and relatively high fuel costs). Since they would be transferable, along with the vessel and permit, a fisherman could be reimbursed for leaving the fishery (assuming someone wanted to buy his allocation and vessel). Under the system of annual vessel quotas, the fisherman would have the opportunity to harvest his share of the total allowable harvest in a manner most appropriate to him. The vessel owner would not need to worry about being pre-empted in securing his catch. Rather, he would apply his capital and labor most efficiently so as to reduce his costs of harvesting. With no explicit allocations, harvesting costs would rise as a result of a race between vessel operators to secure as large a share as possible of the annual or quarterly quotas before any closure or effort restrictions were implemented. The additional capital and labor that would likely be employed by individual vessels in this race would increase costs per unit of resource landed and result in economic inefficiency.

The nature and extent of fluctuations in ex-vessel prices could vary with the pattern and variations in landings. Under an individual vessel quota system, it is expected that prices would be stable throughout the year as fishermen could respond rationally to changing supply-demand conditions. Stability of prices to the harvesting sector could tend to stabilize or decrease consumer prices.

Net income to fishermen from harvesting a given quota could be greater under a system of individual vessel allocations than it would be under no explicit allocation system since a fisherman would know his allocation and could harvest it as efficiently as possible.

Under a system of annual vessel quotas, with the expected reduction in fluctuations in landings, employment in the processing sector should be more stable throughout the year. The processors could more rationally plan their operations and finances. In other words, operations would depend on the schedules developed between a processor and the vessels working with that processor, the way the fishery has traditionally operated, without the possibility of those schedules being changed by reductions in fishing times or by closures as is possible under the current regime. It would also allow employees of processing plants to have more certainty over the flow of income throughout the year.

Under the individual vessel quota system the initial distribution of the allocations would be based largely on recent historic relative catch performance by individual vessels in the fleet. Thus, there would be no abrupt changes in the pattern of fishing or in shares of vessels.

The long run distributional impacts of this system will depend on how these allocations are transferred. Presumably, they will be transferred towards relatively more efficient harvesters and, thus, positive distributional impacts will be received by consumers, harvesters, and processors.

A significant issue relative to distributional impacts is the acceptability of the initial distribution to participants in the fishery. Direct allocation systems have been discussed for many years in the industry, including intensive discussions of a variety of proposals by the Council's Surf Clam and Quahog Advisory Subpanel during the development of this Amendment. While there is significant apparent support for the concept of direct allocations, to date there has been no agreement on a way to make the initial allocations.

Management Impacts

Any scheme which assigns property rights, as would the individual vessel allocations scheme, would be expensive to initially design, implement, and monitor relative to a system of implementing an overall catch limitation with no explicit allocation mechanism. This is a consequence of the need to monitor each vessel's catch. However, other enforcement costs should be reduced since there would be no need to monitor vessel fishing days or starting/ending times.

Under a system of vessel allocations, an individual vessel would cease fishing once its annual allocation was reached. Closures would be self-imposed by individual fishermen and the need for regulation of catch rates would be non-existent. This would reduce management and enforcement costs relative to enforcing overall quotas.

Alternative 9: Continue the provision to close areas with large numbers of small clams and impose a 5.5" size limit. The ocean quahog regime would continue unchanged.

Conservation and Environmental Impacts

Except for the size limit and area closure benefits (see alternative 2), for the surf clam fishery this alternative is similar to alternative 1. For the ocean quahog fishery, the regime with this alternative is the same as that in alternative 2, so the impacts of this alternative on the ocean quahog fishery should be the same as those of alternative 2.

Economic Impacts

This alternative assumes that the surf clam industry can successfully operate without regulation. The experience of the fishery from 1974-1976 argues against this premise. The economic impacts are likely to be similar to alternative 1 for the surf clam fishery. There could be negative impacts on the ocean quahog fishery to the extent that surf clam landings could be higher with this alternative than with alternative 2, potentially decreasing demand for ocean quahogs.

Management Impacts

The only management responsibilities of this alternative are to enforce the size limit and the closure criteria, therefore, the management burden is less than the one associated with the current Plan. However, management costs associated with the ocean quahog fishery would not be different with this alternative than with alternative 2.

XII-4. Tradeoffs Between the Beneficial and Adverse Impacts of the Preferred Management Option

Introduction

There are many possible combinations of the alternatives. The set recommended in the public hearing draft of this Amendment was a combination of alternatives 2, 4, 5 (either 5a or 5b), and 7.

Public comment on the hearing draft (see Appendix II) was largely in favor of the recommended package of alternatives, although each of the proposals was criticized by at least one reviewer. It should be noted that several reviewers substantially modified their written or oral comments after the public comment period had ended by statements made at the 29 May 1981 meeting of the Surf Clam and Ocean Quahog

Advisory Subpanel, at the 10 June 1981 meeting of the Council's Surf Clam and Ocean Quahog Committee, and/or at the 11 June 1981 Council meeting.

The Surf Clam and Ocean Quahog Advisory Subpanel met on 29 May 1981 and reviewed the comments made at the public hearings and the written comments received as of that date. The Subpanel then reaffirmed its support for a combination of alternatives 2, 4, 5a, and 7 with 2 modifications:

- A. That the 2,500 bushel harvesting criterion could be met by harvesting FCZ clams, not clams from the Mid-Atlantic Area only. This would mean that New England fishermen would not be required to come to the Mid-Atlantic to catch the clams needed to keep their permits.
- B. That the Regional Director be permitted to move the starting time of the fishing week from 6:00 am Sunday to 12:00 am Sunday if fishing periods were set at 18 hours, 36 hours, or other time periods evenly divisible by 18.

The Council's Surf Clam and Ocean Quahog Committee met on 10 June 1981 and reviewed the public comments, the recommendations of the Advisory Subpanel, NMFS comments, and the comments of the New England Council as presented by members of that Council at the Committee meeting. The Committee reaffirmed its support for a combination of alternative 2, 4, 5a, and 7, as modified by A and B above and by:

- C. The Regional Director, after consultation with the Council and opportunity for public comment, would set the annual quota within the Optimum Yield range. In setting the quota the Regional Director is required to consider current stock assessments, catch reports, and other relevant information concerning: exploitable and spawning biomass, fishing mortality rates, magnitude of incoming recruitment, projected effort and corresponding catches; and status of areas previously closed to surf clam fishing that would be reopened during the year. The quota must be set to that amount which is consistent with the objectives of the Plan.
- D. In order to make the objectives more specific to the fishery, the objectives in the hearing draft were expanded to retain the objectives of the current Plan with minor modifications (see Sections II, IV, and XII-1).
- E. Review the proposed criteria for reopening areas closed to surf clam fishing. The new criteria would be "... that a closed area or portion of a closed area may be reopened to fishing when the average clam length in the dominant (in terms of weight) size class in the area to be reopened has reached 5.5", if appropriate given all relevant biological, environmental, and economic considerations.
- F. Modify the minimum surf clam size limit so that it would only apply to clams taken in the Mid-Atlantic Area.
- G. Change the New England Area Optimum Yield from 25,000 bushels to a range of 25,000 to 100,000 bushels, with the annual quota set following the same procedures used to set the Mid-Atlantic Area quota.
- H. Change the bad weather make-up day provision to reflect the procedures currently used by NMFS.
- I. Include a provision that the size of the quarterly quotas in the ocean quahog fishery, should it become necessary to institute them, be based on historical fishing patterns.
- J. Change all references to the "Assistant Administrator" to "Regional Director."

On 11 June, the Council adopted the above recommendations of the Committee with the following additions which were modified by the Council on 9 July:

- K. The implementation of alternative 5a is qualified such that the Council must review the limited entry program and announce its findings during the fishing year immediately following the fishing year during which any of the following occurs: the annual quota reaches 50 million pounds, or less than 90% of the annual quota is harvested, or two Plan years have lapsed since the implementation of alternative 5a; furthermore, it is understood that the limited entry program (alternative 5a) shall

continue in force unless abolished or modified via Plan Amendment.

- L. A vessel which is accidentally lost to the fishery shall lose its permit (i.e., be considered as having retired from the fishery) if the owner of such vessel has not let a contract for a new vessel within one year of the loss of the original vessel.
- M. Prior to revocation or rescission of a permit, the Regional Director would give the permittee notice and afford him an opportunity to be heard. In the event the facts adduced indicate a hardship or special reasons exist, the Regional Director shall consider them in determining the disposition of such permit.

The effect of all of these actions is a Plan that includes annual quotas of surf clams and ocean quahogs and a 5.5" surf clam minimum size in the Mid-Atlantic Area. The New England surf clam management area is continued. In the Mid-Atlantic Area, surf clam quarterly quotas are equal. The bad weather make-up day will be in effect during November, December, January, February, March, and April. The surf clam fishing week begins at 6:00 am Sunday and ends at 6:00 pm Thursday, but may begin at 12:00 am Sunday under certain conditions. The effort restrictions are changed slightly to remove the mandatory reduction to 24 hours at the beginning of each quarter, but effort restrictions will be set so as to ensure fishing throughout each quarter with the minimum chance of closure while also minimizing effort changes during each quarter. A permit limitation system will be imposed in the Mid-Atlantic surf clam fishery for at least three years. Areas closed for containing concentrations of small surf clams, when reopened, will have allowable catches separate from the overall quota and appropriate effort restrictions will be imposed in such areas to insure that the harvest of the allowable catch extended throughout the time period specified for the area. Fishermen will be required to advise NMFS if they want to fish in reopened areas.

In the ocean quahog fishery, the provisions of the current Plan remain in effect, except that the annual quota will be set through an administrative process within the range of 4 to 6 million bushels.

The process of setting quotas annually using the most recent data available provides greater flexibility than the system of setting specific quotas in the Plan and revising them through Plan Amendments. This process is less costly to administer than using frequent Plan Amendments to set quotas.

The changes to the effort limitations are also intended to make the regime more flexible.

The extension of the bad weather make-up day from 4 to 6 months, coupled with equal quarterly quotas, rather than quotas that are higher in the summer than in the winter, should result in fishermen being able to fish when the seasonal demand is best. It should also minimize the hazards associated with fishing during bad weather conditions.

Managing reopened areas separately has positive and negative impacts. It introduces a new level of administrative complexity into the regime. It also introduces new enforcement problems associated with whether a fisherman is fishing in the areas that he is supposed to or whether he is reporting his catch appropriately. Since these issues involve enforcement at sea, and since at sea enforcement is difficult to achieve at adequate levels given probable enforcement resources, they are negative impacts. However, there are positive impacts associated with this measure. It is possible to set quotas appropriate to resource levels in each area. Thus, it is less likely that an area would be overfished by the entire Mid-Atlantic quota being taken from relatively small areas. It will also tend to minimize the potential impacts of reopening closed areas where, presumably, the catch per unit of effort will be substantially greater than in other areas, thus leading to a small number of hours per week needed to catch the quarterly quota. Reduction in the number of vessels also reduces administrative and enforcement costs.

Replacement of Moratorium with a Permit Limitation System

Limited Entry and Plan Objectives

Objective 2 is to "minimize economic dislocation to the extent possible consistent with objective 1 and encourage efficiency in the fishery." The Council selected this objective in recognition of the economic ramifications of the various conservation aspects of the Plan, and to address the other problems which suggest the use of limited entry as a stabilizing feature of the fishery management program.

Use of limited entry in the case of the surf clam fishery helps assure that the management program is

consistent with the National Standards for Fishery Conservation and Management. National Standard #5 requires that "conservation and management measures shall, where practicable, promote efficiency in the utilization of fishery resources; except that no measure shall have economic allocation as its sole purpose." The proposed limited entry program is not intended for economic allocation. The Council recognizes that economic allocation in the fishery would not be possible or desirable given our understanding of the fishery and the circumstances now facing the industry.

The regulations explaining and providing guidance for the preparation of fishery management plans provide important guidance for developing limited entry programs. Section 602.3(b)(13)(vi) states "...Limited access is a management technique that is directed at economic as well as biological objectives. This technique is used to reduce the congestion and economic waste that often occurs from the "open access" condition of common property fisheries."

The guidelines clarifying National Standard #4 discuss equity in allocation and the right of entry into fisheries. Section 602.2(e)(3) states "The opportunity of new participants to enter a fishery should be protected wherever feasible and in a manner which prevents excessive fishing effort."

The guidelines clarifying National Standard #5 emphasize the need to promote efficiency, while at the same time exercising care that measures to promote efficiency are analysed with respect to their effect on the price of fish, fishing vessels, or other factors. Any decision must be informed and take full account of all circumstances. The Council has had the benefit of a thorough analysis of the social and economic factors relating to the fishery and use of limited entry to manage the fishery, and has reached its determination in full cognizance of the National Standards and guidelines.

Factors Suggesting Use of Limited Entry in the Plan

The surf clam fishery, like any fishery dependent on a limited resource, presents a complex management problem. Each management measure in the Plan is a part of a coherent program designed to address the management problems. Limited entry is an integral part of the management program which helps to minimize or avoid problems which would otherwise occur.

The Council recommended a moratorium on new entrants into the fishery as a part of the original Plan implemented in November of 1977. That moratorium was intended to address many of the factors described above, and to stabilize the situation while the Council tried to develop an alternative limited entry system. The Council was, in retrospect, overly optimistic that an alternative valid and acceptable for long-term management could be developed quickly. Amendment #2 to the Plan continued management with the moratorium for two years while additional development of a limited entry system continued. That effort was focused primarily on the development of a stock certificate program, which essentially confers property rights on fishery participants. Stock certificates are generally considered the most effective and efficient way to achieve long-term equitable allocation and management of fishery resources.

While most of the operators in the industry appear to favor the stock certificate concept, which allows for new entry and the achievement of long-term stability and efficiency, there is no substantial agreement on a means to provide for initial allocations. Two years of intensive work involving industry and the Council resulted only in the conclusion that the problem could not immediately be solved. The present proposal for a limited entry program was suggested when it became clear that a stock certificate program was not feasible for this Amendment. The proposal represents a development and liberalization of the limited entry embodied in the moratorium by providing for new entrants as inactive vessels leave the fleet. The proposed program addresses the factors suggesting limited entry as follows:

1. Facilitating management.

An open access fishery is difficult to manage because the amount of effort directed at harvest can increase catch rates to the point where it is impossible to reduce them to manageable levels or to determine when and if fishery closure is necessary. With an increased number of potential operators, a statistical program to determine removal rates is complicated.

The proposed limited entry program defines and limits the number of operators in the fishery to a number equal to, or less than, those currently operating. In three years of management we have generally been

able to monitor harvests and recognize the need for adjustments, making recommendations for corrective action. The fishery is of a size which facilitates the close communication and cooperation between government and industry which is necessary under a restrictive management situation. Industry compliance with reporting and recordkeeping requirements has been excellent, and information needed for management has always been provided by industry on a timely basis.

2. Overcapitalization and overfishing.

An open access fishery tends to attract effort to the point where the marginal return on factor inputs is zero. Tax policies and other factors tend to encourage opportunistic capital to invest in fisheries even beyond the point where a fishery is not profitable. Such investments may result in significant loss to the investors. Worse, from the standpoint of stability in the fishery, they erode the profitability of every other operator to the zero profit or loss position. Thus an opportunistic investor can adversely affect the well-being of traditional fishermen. While the investor likely has other prospects, the fisherman sees the destruction of a way of life and a heritage. When profitability is reduced to zero, intense political pressure is often brought to bear to attempt to relax those portions of the program based on sound biological management. Thus, overcapitalization sets the stage for overfishing.

The proposed limited entry system should lead to a phased and orderly reduction in the number of vessels licensed to participate in the fishery. The Council believes that the reduction in licensed vessels resulting from requirements for participation under the original moratorium will continue, and that over a period of several years the number of vessels will, through natural attrition, reach an equilibrium level. It is clear that during the moratorium individual operators have increased the capacity of their vessels to improve their relative position, and that the fishing capacity of the fleet has thus increased substantially. However, informal studies of factor substitutability indicate that further significant improvement of harvesting capacity of existing vessels is not likely. Thus, harvesting capacity has probably reached a new plateau of equilibrium. In providing for replacement of vessels which leave the fishery by loss of permit over the next several years, the Council recognizes that new entrants into the fishery will harvest more clams than the marginal or inactive operators they replace, and thus only a portion of the vessels which leave the fishery are to be replaced.

3. Stability in the fishing community.

Most of the operators in the surf clam fishery have a tradition in the fishery. Generally, operators enter the fishery as crewmen on vessels, eventually working their way into a position of vessel ownership. The current fishery has at its core a stable community which looks forward to continued dependence on the industry for its livelihood. The Council believes that that opportunity should be preserved.

A great expansion in the number of surf clam vessels occurred in 1976 and 1977 as a response to very high surf clam prices which were the result of limited resource availability. Most of the operators who enter a fishery at such a time are interested in short term benefits and may not be cognizant of the long term investment situation in a fishery. As a result, such operators may be ill prepared for natural fluctuations in the fishery or in markets, and their presence, by diluting the possible average return to a vessel, reduces the stability of the fishery for all participants. The proposed program would ensure that no operator could enter the fishery without first going through a waiting period during which he would be fully aware of the management measures and potential of the fishery as an investment.

4. Conditional fishery status.

The surf clam fishery was declared a conditional fishery by NMFS just prior to the implementation of the management program. That declaration was based on an assessment that guaranteed financing of added fishing capacity would be inconsistent "... with the wise use of the fisheries resource and with the development, management, conservation and protection of the fisheries resources..."

The conditional fishery declaration restricts the future availability of any NMFS financial assistance which would result in significantly increasing the fishery harvesting capacity, and is based on documentable environmental, biological, economic, and social data, balanced by the national interest in an efficient, competitive, and safe fishing fleet. The declaration required a finding that conditions prevail that are basically consistent with the use of limited entry as a continuing aspect of the management of the surf clam fishery.

5. Relaxing current fishery restrictions.

The primary management tool used to control the harvest of surf clams within the levels established as Optimum Yield is the restriction of allowable fishing time. For the last nine months, and for much of the period under management, vessels have been allowed to fish only 24 hours per week. A further reduction to 12 hours per week is planned for the immediate future. Clearly, the existing fleet capacity is well more than sufficient to harvest any expected allocation, and so a stabilization or reduction of capacity would be consistent with encouraging efficiency. Prior to the management regime, vessels had unlimited fishing opportunity. Fishermen make a convincing argument that until they can again operate without the present severe restriction on fishing time, vessels should not be added to the fleet.

The proposed program will allow the fishery to seek an equilibrium point of its own through natural attrition, eventually bringing economical harvesting capacity into balance with the Optimum Yield.

6. Recovery of traditional operators.

The restriction of fishing time has posed a continual burden on operators in the fishery. Other aspects of the management program, including the closure of areas containing small surf clams, have required an investment by existing participants in the future health and expansion of the fishery resource. Many of the current participants have seen their margins of profitability reduced substantially as they have complied with the management program. Few operators have significant financial reserves to draw upon any longer. It would be unfair to allow the benefits of this investment, made in good faith and for the benefit of the nation, to be dissipated among new entrants who had not made the sacrifices attendant to management. If the fishery returned to immediate open access, the competitive ability of many current participants would be insufficient, because of their investment in the management program, to guarantee they would not be displaced or suffer losses through dilution of the available revenue from the fishery.

It seems just and fair that the investment in the form of agreement and compliance with the management program should be repaid from the benefits that the program will soon provide. If the investment is not repaid, but rather dissipated among new entrants, traditional operators will suffer. The proposal, by providing for review of the program when Optimum Yield reaches the estimated sustainable yield, will protect to some degree the investment of the traditional operators until they have realized some benefits from it.

7. Conforming with National Standards.

National Standard #4 required the protection of the opportunity of new participants to enter a fishery wherever feasible and in a manner which prevents excessive fishing effort. The plan should, therefore, attempt to provide such opportunity, with conditions to prevent the addition of excessive effort.

The proposal provides for new entry as vessels leave the fishery through natural attrition, by replacing only a portion of the vessels which leave, the program should allow new entry without permitting addition of excessive fishing effort.

Limited Entry as a Discretionary Provision of a Plan

The MFCMA (Section 303(b)(6)) provides that a fishery management plan may establish a system for limiting access to a managed fishery in order to achieve Optimum Yield if, in developing such a system, the Council and the Secretary take into account six factors. A discussion of those factors and their application to the proposed limited entry program for the surf clam fishery follows:

A. Present participation in the fishery.

In the Mid-Atlantic Area, 144 vessels currently are licensed to harvest surf clams. This represents a considerable reduction of the licensed fleet from the 1979 high of 178 vessels, but is significantly more than the number of vessels actually active in the fishery just prior to the implementation of a management program (1976 - 122). The harvesting capability of the surf clam fleet is such that there are several vessels which could individually, if left unrestrained, harvest the entire annual fishery quota alone. The proposed program of limited entry seeks to reduce the size of the fleet gradually through natural attrition. No vessel which is now actively fishing would be denied access to the fishery.

B. Historical fishing practices in, and dependence on, the fishery.

The surf clam fishery has a history of boom and bust cycles accompanied by significant geographical shifts in the center of activity. The Mid-Atlantic fishery started off Point Pleasant, New Jersey, shifting southward to Cape May, then abruptly to the Virginia Capes, back north to the Delmarva Peninsula, with a recent return to the original fishery centers in New Jersey. The fishery has generally been restricted to a relatively small fleet of vessels which have only limited ability to engage in other activities. Generally, the participants in the fishery at the present time have been involved in the fishery since its development. This includes the major processors, vessel owners, and vessel operators. The proposed limited entry program would tend to dampen the boom and bust cycles. It would also lessen impacts from reopened closed areas.

C. The economics of the fishery.

Economic performance indicators are discussed at length in Section IX, and in the Regulatory Impact Review. Basically, there is a broad range of performance in the fishery. The largest vessels, which tend to be associated with processors through vertical integration, and a number of exceptionally well run independent operators are profitable. A small group of vessels which have virtually unlimited access to market their surf clams or are able to sell ocean quahogs are exceptionally profitable. The fleet as a whole, however, suffers from significant excess harvesting capacity. Industry advisors have offered estimates that perhaps 70 to 80 well run vessels could operate profitably in the fishery under current conditions of the resource and the market. The licensed fleet is twice that size and it appears that on average the fishery is not profitable. Calculated net losses for the unprofitable vessels exceed net profits of the profitable vessels.

D. The capability of fishing vessels used in the fishery to engage in other fisheries.

Surf clam vessels have a physical configuration, and carry gear which is not adaptable to other fisheries except at considerable effort and cost. The only exception is the ocean quahog fishery, which uses the same gear and harvesting techniques, but generally requires large vessels because of the greater depths where quahogs are found, the greater distances from shore, and the larger quantities of quahogs needed to make a profitable trip. A number of surf clam vessels do not harvest ocean quahogs as a supplement or as their primary fishery. The proposed limited entry program will not force operators out of the fishery unless they clearly do not meet a minimum standard of involvement and activity in the fishery. The program is designed to continue over a period long enough to allow the number of operators to seek its own equilibrium level through natural attrition and greater awareness of the costs and benefits obtained in the fishery.

E. The cultural and social framework relevant to the fishery.

Many of the vessels in the fishery are smaller, older, and are owned and operated by independent, individual fishermen who have obtained their position of ownership through individual enterprise. The fishery is extremely important locally in several Mid-Atlantic ports and represents the most valuable single species fishery conducted in the Mid-Atlantic area. There is a strong tradition of surf clam fishing within families. Many of the family operated businesses are the most vulnerable to an influx of additional vessels because they are not in a position to survive long periods without revenue, or to operate at significantly lower levels of gross revenue.

F. Any other relevant consideration.

Although surf clam fishing is not now generally profitable, the fishery is attractive relative to most other Mid-Atlantic fisheries, which are beset by a number of problems, including low resource availability and overcapitalization. The surf clam fishery is moving towards stability after three years of a vessel moratorium. The management program has had notable success since the stocks are rebuilding. The vessels which were in the fishery in 1977, when the management program was initiated, have had to sacrifice income opportunity as a part of the rebuilding program. While the net benefits to society from the management program have never been, and are not now in question, the benefits to individual operators who have made the sacrifice could quickly be lost or eroded among new entrants. The period of sacrifice has stretched over three years, and it continues. It would be unfair to dissipate the investment of these operators, who have behaved responsibly and made the difficult decision to forego short term

profits for long term stability, among a flood of opportunistic new entrants. The proposed program of limited entry allows traditional operators to recoup at least a portion of their sacrifice, and will afford an opportunity for new entrants to be fully cognizant of the risks and potentials of the fishery before they commit themselves to investment in the fishery. Such a program will promote resource stability and industry efficiency which is in the best interests of the fishing community and the nation.

Changes as a Result of Public Comments

Items A through L above were changes largely made as a result of comments made during the public review of the Amendment. A, F, and G are designed to minimize impacts on New England fishermen. Item A would permit them to meet the 2,500 bushel criterion by fishing in the New England Area. The New England Area was created in Amendment #2 to permit the development of the New England surf clam fishery with minimal regulations. Establishment of the Optimum Yield range would permit the fishery to develop within limits, with the annual quota based on the best available data. Exemption of the New England Area from the size limit is appropriate until more information is available on the biology of the New England FCZ surf clam resource.

Item B, the possible expansion of the fishing week to 12:00 am Sunday, would allow vessels that operate more efficiently at 18 hour fishing periods to fish for that period if weekly fishing times permit it, and still land clams for processing on Monday if enforcement resources are adequate to deal with the expanded period.

Items C, D, E, H, I, J, and L are refinements to the provisions of the hearing draft and are not substantive changes.

Item K is considered necessary in order that the limited entry system is evaluated periodically.

Item M is intended to provide an opportunity for a person to retain a surf clam permit in the event that extenuating circumstances prevent the person from catching the required 2,500 bushels.

The Recommended Alternative Relative to Plan Objectives

- 1. Rebuild the surf clam populations to allow eventual harvest approaching the 50 million pound level, which is the estimate of maximum sustainable yield over the range of the resource, based on the average yearly catch from 1960 to 1976.**

The Optimum Yield range, quota setting process, size limit, area closure and reopening procedures, entry limitation, and effort restrictions should work as an overall program to achieve this objective. Harvests are constrained to biologically acceptable levels. A probability of successful surf clam spawning is enhanced by the size limit. The effort limitations, reopening provisions, and entry limitations should serve to minimize resource damage through highly intensive dredging.

- 2. Minimize economic dislocation to the extent possible consistent with objective 1 and encourage efficiency in the fishery.**

The limited entry program is the primary measure designed to achieve this objective.

- 3. Prevent the harvest of ocean quahogs from exceeding maximum sustainable yield and direct the fishery toward achieving Optimum Yield.**

The Optimum Yield range is considered reasonable in light of available information. The ocean quahog management regime is designed to impose no restrictions on the fishery other than an annual quota unless the fishery expands significantly, thus imposing no barriers on fishery development, within biological constraints.

- 4. Provide the greatest degrees of freedom and flexibility to all harvesters of these resources consistent with the attainment of the other objectives of this Plan.**

Certain aspects of the recommended regime are restraining on fishermen, particularly the effort limitations. However, with the limitations on entry to the Mid-Atlantic Area surf clam fishery, it should

be possible to relax these restrictions in the long run. The revisions to the New England Area regime should remove constraints on that fishery to encourage its development.

5. Optimize yield per recruit.

The surf clam size limit is intended to enhance the attainment of this objective. The separate restrictions for reopened areas should preclude excessive incidental mortalities.

6. Increase understanding of the conditions of the stocks and fishery.

The reporting requirements of the Plan, along with the research outlined in section XVI, should result in this objective being attained.

The Recommended Alternative Relative to the National Standards

Section 301(a) of the MFCMA states that: "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 the adopted Amendment changes in any way the consistency of the original Plan.

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

Harvests at the Optimum Yields specified should not endanger future harvests. The management measures should result in Optimum Yields being achieved while providing adequate safeguards to minimize chances of overfishing.

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

The recommended alternative is based on the best scientific evidence currently available, as outlined in Section V-2.

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.

This recommended alternative meets the requirements of this standard by simultaneously managing surf clams and ocean quahogs in a complementary manner throughout their ranges in the FCZ.

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 Optimum Yields and US capacity estimates described in the recommended alternative will accommodate US demand for surf clams and ocean quahogs without prejudice to residents of any State. The distributions of these species make it extremely unlikely that fishermen of any State or region could harvest the US capacity before the species become available to other US fishermen. Creating separate management areas for reopened closed areas should serve as an additional safeguard that this standard will be achieved. The continuation of the separate management area for New England will ensure that fishermen in that area are not negatively impacted by measures directed at managing the Mid-Atlantic Area.

The permit limitation system is designed to permit continuation of the traditional fishery in an orderly manner. Since, following the initial year of operation, there are no eligibility criteria for permits under this system, other than harvesting 2,500 bushels of surf clams or ocean quahogs annually from the FCZ to have a permit renewed, the system does not discriminate between residents of different States. The permit system should not affect the relative structure of the fishery.

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 recommended alternative does not change the Plan's consistency with this standard.

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

The recommended alternative does not change the Plan's consistency with this standard.

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

The recommended alternative does not change the Plan's consistency with this standard.

XII-5. Specification of Optimum Yield

The Council has determined that the annual surf clam Optimum Yield for the Mid-Atlantic Area is 1.8 to 2.9 million bushels (30 - 50 million pounds of meats) and for the New England Area is 25,000 to 100,000 bushels (425,000 - 1.7 million pounds of meats). A conversion of 17 pounds of meats per bushel for offshore surf clams has been used to convert from bushels to pounds. The annual ocean quahog Optimum Yield for the entire area is between 4.0 and 6.0 million bushels (40 - 60 million pounds of meats), with a conversion factor of 10 pounds of meats per bushel. The surf clam Optimum Yield for the Mid-Atlantic Area has as its lower bound the quota level that has been in effect since the original Plan and is considered to be the lowest necessary quota in the absence of a major resource crisis. The upper bound is the maximum sustainable yield estimate. The surf clam Optimum Yield range for the New England Area is considered an appropriate range to permit the development of what is an exploratory fishery in the absence of adequate stock assessments. The ocean quahog Optimum Yield range is based on available biological information (see Section V) relative to providing quota levels appropriate to permit the fishery to develop. The quotas will be selected annually from within these ranges based on the NMFS stock assessment and other relevant data. Since US harvesting capacity, and the intent of US fishermen to use that capacity (see Section IX-1) if permitted by the quotas, for both species exceeds the Optimum Yields, the Total Allowable Level of Foreign Fishing is 0. Since US processing capacity, and the intent of US processors to use that capacity if quotas permitted, is at least equal to the Optimum Yields and to US harvesting capacity, there is no provision for joint venture processing.

XIII. MEASURES, REQUIREMENTS, CONDITIONS, OR RESTRICTIONS SPECIFIED TO ATTAIN MANAGEMENT OBJECTIVES

XIII-1. Permits and Fees

The permit requirements are continued. Those requirements provide that a vessel owner or operator must obtain a permit in order to conduct a directed fishery for surf clams or ocean quahogs within the FCZ, or land or transfer to another vessel any surf clams or ocean quahogs or part thereof caught within the FCZ. Vessels catching 2 bushels or fewer per day of surf clams or ocean quahogs are not required to have a permit.

Surf Clam Permit Eligibility - Mid-Atlantic and New England Areas

A vessel is initially eligible for a surf clam permit for both the Mid-Atlantic and New England Areas if it had been issued a permit to fish for surf clams pursuant to the moratorium on entry of vessels into the surf clam fishery established in the original Plan and if that permit had not been revoked or is not revokable according to the criteria established for such permits.

Permits will be reissued annually. A vessel must catch a minimum of 2,500 bushels of surf clams or ocean quahogs from the FCZ in each calendar year, based on logbook records, in order to be reissued a permit. A vessel that has a permit to fish only for ocean quahogs cannot obtain a surf clam permit under this provision, except as a new entrant as provided below. If the vessel does not meet the landing criterion, NMFS shall not issue a permit for the upcoming year.

During the first five years that this provision is in effect, NMFS, in addition to permits issued to vessels that have met the harvesting criterion, may issue a new permit for every four permits that have not been reissued or voluntarily returned to NMFS. After the fifth year, the total number of permits may not exceed the total number of permits active (in use) at the end of the fifth year.

Permits are transferable with the sale of the vessel and the owner of a vessel can transfer the permit to a new vessel. However, such actions do not remove the criterion of harvesting a minimum of 2,500 bushels of surf clams from the FCZ each calendar year in order to keep the permit. For example, if the vessel to which the permit was assigned at the beginning of the year had not met the criterion during the year and was sold, with the permit, on the last day of the year, the permit will be revoked and the new owner cannot claim a hardship. If a permit holder sold a permitted vessel without its permit, that vessel would not be allowed to participate in the surf clam fishery unless it was qualified under the new entrant provisions. If a permitted vessel is sunk, that is, lost to the fishery, the permit holder may replace it with a new vessel if a contract for the replacement vessel is let within a one year period.

In the event that a permit is not to be reissued because the required 2,500 bushels were not caught, the Regional Director will give the permit holder notice and afford him an opportunity to be heard. In the event the facts adduced indicate a hardship or special reasons exist, the Regional Director shall consider them in determining the disposition of such permit.

Surf Clam Permit Eligibility - New England Area

There are no eligibility restrictions for vessels fishing for surf clams in the New England Area.

Ocean Quahog Permit Eligibility

There are no eligibility restrictions for vessels fishing for ocean quahogs.

General Permit Requirements

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.

XIII-2. Catch Limitations

Foreign Fishing

Fishing for surf clams or ocean quahogs in the FCZ by any vessel other than a vessel of the US is prohibited.

Domestic Catch Quotas

Surf clams: The Optimum Yield, Domestic Annual Harvest, Domestic Annual Processing, and annual quota for surf clams equal between 1.8 and 2.9 million bushels (approximately 30 - 50 million pounds of meats) for the Mid-Atlantic Area and between 25,000 and 100,000 bushels (approximately 425,000 and 1,700,000 pounds of meats) for the New England Area. In the Mid-Atlantic Area, the annual quota is divided into equal quarterly quotas, the quarters being: 1 January - 31 March, 1 April - 30 June, 1 July - 30 September, and 1 October - 31 December. If the first day of a calendar quarter does not fall on Sunday, then the fishing quarter will begin on the first Sunday of the new calendar quarter.

Prior to the beginning of each year, after consultation with the Council and opportunity for public comment, the Regional Director may adjust quotas and estimates of Domestic Annual Harvest and Domestic Annual Processing within the ranges specified above. In selecting the quota the Regional Director shall consider current stock assessments, catch reports, and other relevant information concerning

1. Exploitable and spawning biomass relative to the Optimum Yield.
2. Fishing mortality rates relative to the Optimum Yield.
3. Magnitude of incoming recruitment.
4. Projected effort and corresponding catches.
5. 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 Plan.

It is the Council's intent that this quota setting process will not involve the preparation of a Plan Amendment and a Supplemental Environmental Impact Statement to establish the annual quotas.

If the actual catch of surf clams in any one quarter falls more than 5,000 bushels short of the specified quarterly quota, the Regional Director shall add the amount of the shortfall to the next succeeding quarterly quota. If the actual catch of surf clams in any quarter exceeds the specified quarterly quota, the Regional Director shall subtract the amount of the excess from the next succeeding quarterly quota. The Regional Director shall publish a notice in the Federal Register whenever the quarterly quota for surf clams is adjusted. It is understood that this process would also operate between years, that is, between the last quarter of one year and the first quarter of the next year.

Ocean Quahogs: The annual Optimum Yield, Domestic Annual Harvest, Domestic Annual Processing, and quota for ocean quahogs will be between 4.0 million bushels and 6.0 million bushels (approximately 40 - 60 million pounds of meats). If it appears that the annual quota for ocean quahogs will be exceeded, the Regional Director, in consultation with the Council, may establish quarterly quotas for ocean quahogs, and in that event, the Regional Director shall publish notice of such quarterly quotas in the Federal Register. The distribution of the annual quota to quarterly quotas will be based on historic harvesting patterns in the fishery. The annual quota and estimates of Domestic Annual Harvest and Domestic Annual Processing

for ocean quahogs will be developed following the procedures described above for surf clams.

Closure: If the Regional Director determines (based on logbook reports, processor reports, vessel inspections, or other information), that the quota for surf clams or ocean quahogs for any time period will be exceeded, the Regional Director shall publish a notice in the Federal Register, stating the determination and, if necessary, stating a date and time for closure of the surf clam or ocean quahog fishery for the remainder of the time period. The Regional Director shall send notice of the action to each surf clam or ocean quahog processor and to each permitted surf clam or ocean quahog vessel owner or operator.

XIII-3. Restrictions

No person shall harvest or possess surf clams from the Mid-Atlantic Area smaller than 5.5 inches in length.

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.

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.

XIII-4. Effort Restrictions

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.

Surf Clams - New England Area

Fishing is permitted seven days per week. When half of the annual quota has been harvested, the effort restrictions described above for the Mid-Atlantic Area will apply to the New England Area, if necessary to permit fishing throughout the remainder of the year.

Ocean Quahogs

Fishing for ocean quahogs is permitted seven days per week.

When 50% of the quota of 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 per 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.

XIII-5. Closed Areas

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

The following areas shall be closed to fishing because of environmental degradation:

38°20'00"N - 38°25'00"N and 74°10'00"W - 74°20'00"W
38°40'00"N - 39°00'00"N and 72°00'00"W - 72°30'00"W

The Regional Director may open these areas when the Food and Drug Administration 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 by the Food and Drug Administration, they may be closed by the Regional Director after public hearing is held to discuss and assess the effects of such closure.

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 percent or more are smaller than 4.5 inches in size and not more than 15 percent are larger than 5.5 inches 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 and the Regional Director shall hold a public hearing on the proposed closure.

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 areas closed pursuant to this provision may be reopened to fishing when the average clam length in the dominant (in terms of weight) size class has reached 5.5 inches in length, if appropriate given all relevant biological, environmental, and economic considerations. It also is permissible to selectively open closed areas or portions thereof under specially developed controls to permit selective harvesting if the long-term yield or growth rate of the dominant (in terms of weight) surf clam size class in the area to be reopened would be significantly enhanced by permitting such reopening. 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.

XIII-6. Vessel Identification

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 inches 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.

XIII-7. Facilitation of Enforcement

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.

XIII-8. Habitat Preservation, Protection and Restoration

The Council is deeply concerned about the effects of marine pollution on fishery resources in the Mid-Atlantic. It is mindful of its responsibilities under the MFCMA to take into account the impact of pollution on fish. The extremely substantial quantity of pollutants which are being introduced into the Atlantic Ocean poses a threat to the continued existence of a viable fishery. In the opinion of the Council, elimination of this threat at the earliest possible time is determined to be necessary and appropriate for the conservation and management of the fishery, and for the achievement of the other objectives of the MFCMA as well. The Council, therefore, urges and directs the Secretary to forthwith proceed to take all necessary measures including, but not limited to, the obtaining of judicial decrees in appropriate courts to abate, without delay, marine pollution emanating from the following sources: (1) the ocean dumping of raw sewage sludge, dredge spoils, and chemical wastes; (2) the discharge of raw sewage into the Hudson River, New York Harbor, and other areas of the Mid-Atlantic Region; (3) the discharge of primary treated sewage from ocean outfall lines; (4) overflows from combined sanitary and storm sewer systems; and (5) discharges of harmful wastes of any kind, industrial or domestic, into the Hudson River or surrounding marine and estuarine waters.

XIII-9. Development of Fishery Resources

No government action is needed at this time.

XIII-10. Management Costs and Revenues

It is expected that the governmental costs of implementing the recommended alternative will be similar to those experienced in enforcing the original Plan and Amendments #1 and #2. Council costs since the implementation of Amendment #2, that is, costs to monitor Amendment #2 and prepare Amendment #2 totalled approximately \$53,400 in administrative funds and approximately \$24,900 in contract funds. Annual Council costs to implement Amendment #3 should be approximately \$12,700 in administrative costs and \$15,000 in contract costs. The contract funds are used to survey surf clam areas for closure and reopening. NMFS costs are estimated at \$150,000 for enforcement, \$5,000 for logbook printing and handling, \$24,000 for General Counsel, \$25,000 for Regional Office administration, and \$2,000 for Washington Office administration.

XIV. SPECIFICATIONS AND SOURCES OF PERTINENT FISHERY DATA

XIV-1. General

The following are recommended in order for the Council and NMFS to 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 and include the territorial sea and the FCZ. 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 the data must be developed. The following requirements are those currently in effect and are included here only to provide the reader with a complete understanding of the requirements of the Plan. The Council believes that these reporting requirements should not be changed as a result of any project currently underway to revise the reporting requirements for other fisheries.

XIV-2. Reports and Records

Dealers

All persons who buy surf clams and ocean quahogs from vessels engaged in the surf clam or ocean quahog fishery 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; number of bushels purchased, by species; 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; and meat yield per bushel by species.

All persons required to submit reports under the above paragraph shall also be 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 dealer or processing plant employees, by month; number of employees processing surf clams and ocean quahogs, by species, by month; total payroll for surf clam and ocean quahog processing, by month; capacity to process surf clams and ocean quahogs, by species; and projected capacity to process surf clams and ocean quahogs, by species, for the following year.

All persons purchasing or receiving any surf clams or ocean quahogs at sea for transport to any port in the US shall maintain and provide to the Regional Director records identical to those required under the above paragraphs.

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

Owners and Operators

The owner or operator of any vessel with a permit in the surf clam or ocean quahog fisheries 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; crew size; crew share by percentage; landing port; date sold; price per bushel; buyer; and size distribution of surf clams and ocean quahogs sold, by species, on a percentage basis. 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.

All persons required to submit reports under the above paragraphs shall submit annually to the Regional Director on forms supplied by the Regional Director at least the following information relating to vessel characteristics: name of the vessel, vessel's US Coast Guard documentation number or State license number, engine and pump horsepower, homeport of vessel, hold capacity (in bushels or cages), and dredge size and number of dredges.

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.

XV. RELATIONSHIP OF THE RECOMMENDED MEASURES TO EXISTING APPLICABLE LAWS AND POLICIES

XV-1. Fishery Management Plans

This Amendment is related to other Plans to the extent that all fisheries of the northwest Atlantic are part of the same general geophysical, biological, social, and economic setting. Domestic fishermen often are active in more than a single fishery. Thus, regulations implemented to govern harvesting of one species or a group of related species may impact upon other fisheries by causing transfers of fishing effort. However, no conflicts are anticipated between this Amendment and other plans since the surf clam and ocean quahog fisheries generally operate independent of other fisheries with only rare transfers of fishermen from these to other fisheries. Because of the relatively isolated nature of the surf clam and ocean quahog fisheries, regulations promulgated pursuant to this Amendment should have no impact on other fisheries.

XV-2. Treaties or International Agreements

No treaties or international agreements relate to this fishery.

XV-3. Federal Laws and Policies

The only Federal law that controls the fisheries covered by this Plan is the MFCMA.

Marine Sanctuary and Other Species Management Systems

The USS Monitor Marine Sanctuary was officially established on January 30, 1975, under the Marine Protection, Research, and Sanctuaries Act of 1972. Rules and regulations have been issued for the Sanctuary (15 CFR Part 924). They 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 off the coast of North Carolina at 35°00'23"N latitude - 75°24'32"W longitude, in the Plan's designated management area. The Monitor Marine Sanctuary is clearly designated on all National Ocean Survey (NOS) charts by the caption "protected area". This minimizes the potential for damage to the Sanctuary by fishing operations.

Oil, Gas, Mineral, and Deep Water Port Development

While 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 Bureau of Land Management (BLM), monitors OCS activities and has opportunity for comment as well as opportunity to advise BLM 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: (1) exclusion areas, (2) adverse impacts to sensitive, biologically important areas, (3) oil contamination, (4) substrate hazards to conventional fishing gear, and (5) competition for crews and harbor space. We are not aware of pending deep water port plans which would directly impact offshore fishery management goals in the areas under consideration, nor are we aware of potential effects of Plans upon future development of deep water port facilities.

Potential Impact on Marine Mammals and Endangered Species

Numerous species of marine mammals occur in the northwest Atlantic Ocean, yet definitive species composition is unknown. Indications are that the most common species in the area are the common (saddleback) dolphin (*Delphinus delphis*), harbor porpoise (*Phocaena phocoena*), and harbor seal (*Phoca vitulina*). Data on population abundance for various species, however, is sketchy at best, and for some species is non-existent. In addition, feeding behavior and prey preference are not well understood. These facts in combination make it extremely difficult to assess, even qualitatively, the potential impact of this Plan on marine mammal populations.

Whenever fishing gear and marine mammals occur in the same area, there always exists a potential for an incidental kill of marine mammals. Except in unique situations (e.g., tuna-porpoise in the central Pacific), the incidental kill as a result of commercial fishing activities usually has an insignificant impact upon marine mammal populations. Of the 25 species of marine mammals noted as occurring in the area, 6 have been classified as endangered by the US Fish and Wildlife Service. These are the finback whale (*Balaenoptera physalus*), the humpback whale (*Megaptera novaeangliae*), the right whale (*Eubalaena glacialis*), the blue whale (*Balaenoptera musculus*), the sei whale (*Balaenoptera borealis*), and the sperm whale (*Physeter catodon*). Of these six species, only the first three frequent nearshore waters, the others typically remaining offshore in deep ocean waters. Consistent with the Endangered Species Act of 1973, the Council recognizes the need for an agency consultation (Section 7(a)), to determine whether any management measure contained in this Amendment, which differs in scope and impact from those contained in the current Plan, may jeopardize the continued existence of any endangered or threatened species or result in the destruction of adverse modification of the habitat of such species.

The adopted harvest levels are not expected to cause any declines in surf clam or ocean quahog abundance. Therefore, no change in the availability of these species to those toothed cetaceans and pinnipeds that may utilize them as a food item is expected to occur.

Pursuant to the Marine Mammal Protection Act of 1972, the Council recognizes that no marine mammals may be taken in the course of a commercial fishing operation unless (1) the taking constitutes an incidental catch, as defined in the implementing regulations (50 CFR 216.3); (2) a general permit and certificate(s) of such inclusion have been obtained in accordance with those regulations; and (3) such taking is not in violation of such permit, certificate(s) and regulations. To include full and complete reporting of all instances where marine mammals are taken incidental to commercial fishing operations and pursuant to 50 CFR 216.24, the Council encourages all sectors of the surf clam and ocean quahog fishing industry to obtain a general permit from NMFS for the taking of marine mammals where such taking is probable (5 gear-specific categories are provided).

Outside of certain marine mammals, the only threatened/endangered species occurring in the northwest Atlantic are the shortnose sturgeon (Acipenser brevirostrum) and several species of sea turtles. Because data on occurrences of shortnose sturgeon are vital to understanding its current status, the Council urges fishermen to report any incidental catch of this species to the Shortnose Sturgeon Recovery project of NMFS.

Available data indicate that several species of sea turtles are regularly found in New England waters. These turtles are the Kemp's ridley (Lepidochelys kemp), leatherback (Demochelys coriacea), loggerhead (Caretta caretta), and green (Chelonia mydas). Hawksbill turtles (Eretmochelys imbricata) occasionally stray into the area. The Kemp's ridley sea turtle, while probably the most endangered reptile on earth (total population estimated at several thousand animals), is also the most frequently observed sea turtle in New England waters, especially Cape Cod Bay. Strandings, with many individuals dying as a result, are not infrequent in the Bay and have been known to occur for some time. One possible explanation is that individuals remain in the Bay until late autumn, and with the decrease in water temperature as winter approaches, these animals become subject to hypothermia.

In late autumn 1978 seven Kemp's ridley turtles were found on the beaches along Cape Cod Bay. While several of these individuals were reportedly cut and bleeding when first observed, examination of the preserved specimens did not reveal any major physical damage to the individuals. It is possible that these animals were injured by fishing activity either through entanglement in nets or by contact with a vessel's propeller, but there is no solid evidence to indicate that fishing operations were responsible for the kills. Based on inquiries by NMFS and Massachusetts Division of Marine Fisheries personnel, the general conclusion can be drawn that regular and numerous killings of Kemp's ridley turtles in Cape Cod Bay do not occur as a result of normal commercial fishing operations. Efforts are underway to provide much needed monitoring of turtles and to better inform fishermen and the public about the necessity of protecting these animals, consistent with the position of not interfering, to the extent possible, with legitimate fishing activities.

In conclusion, the Council does not believe that implementation of this Amendment will have adverse impacts upon populations of marine mammals or endangered species. As additional understanding of the status and dynamics of marine mammal and sea turtle populations becomes available, the Council will integrate it into the examination of potential impacts on the environment from fishery management plans.

XV-4. State, Local, and Other Applicable Laws and Policies

State laws regulating this fishery are discussed in Section VII-4 of the Plan. No other State or local laws are known to control these fisheries.

State Coastal Zone Management (CZM) Programs

The CZM Act of 1972, as amended, is primarily protective in nature, and provides measures for ensuring stability of productive fishery habitats within coastal zones. Therefore, each State's CZM program will probably assimilate the ecological principles upon which this Plan is based. It is recognized that responsible long-range management of both coastal zones and fish stocks must involve mutually supportive goals. States in the region with approved CZM Programs are Maine, Massachusetts, Rhode Island, Connecticut, New Jersey, Delaware, Maryland, and North Carolina. Copies of this Amendment have been submitted to states with CZM Programs for review and a determination of consistency. Available approved CZM Programs have been reviewed relative to this Amendment and no inconsistencies have been identified.

XVI. COUNCIL REVIEW AND MONITORING OF THE PLAN

The Council will review the Plan at least annually. The Plan has been developed so that many changes may be made by regulation amendments. However, if problems arise that cannot be solved through regulatory changes, appropriate Amendments will be developed as needed.

Section 304(e) of the MFCMA requires that the Secretary initiate and maintain a comprehensive program of fishery research to carry out the purposes, policies, and provisions of the Act. In order to monitor and predict biological and socioeconomic impacts of the management decisions cited in this Plan, certain basic data must be provided on a continuing basis. Some of these data will be obtained through the recordkeeping provisions outlined in this Plan. Additional data will be available from the routine research cruises and stock assessments of the Northeast Fisheries Center. Monitoring will also be needed in closed areas to determine when these areas should be opened and to provide the basis for estimates of allowable catches. However, some of the biological as well as socioeconomic information needed by the Council will not be available from those sources. Therefore, the Council recommends to the Secretary the following areas of research as being of high priority and requests that a comprehensive program of research be initiated or incorporated into ongoing research and survey efforts.

Biological Research and Monitoring

1. Assessments of distribution, density, population structure, abundance of surf clams and ocean quahogs and estimates of year-class strengths and recruitment successes in the New England Area.
2. Ocean quahog studies, especially age at sexual maturity, natural mortality, yield per recruit, and estimation of maximum sustainable yield.

Suggested form of study/results: On-going studies with annual reports as appropriate.

Fishery Research and Monitoring

1. Evaluation of incidental mortalities caused by fishing relative to various gear, vessel, and fishing technique characteristics.

Suggested form of study/results: One time study.

Processing Sector Research and Monitoring

1. Continuous monitoring of costs, means of production, and wholesale/retail prices.

Suggested form of study/results: Quarterly compilations and reports.

Environmental Research and Monitoring

1. Assessment of hydrographic influences on reproductive and recruitment success, and transport and setting success.
2. Estimation of impacts of ocean dumping, dredging, and other coastal activities on resources; prediction of probable impacts on resources from these operations in short and long-term.

Suggested form of study/results: One time study and report on 1. On-going study and monitoring of 2, with annual reports. Especially important is the capability for short-notice intense assessments on an emergency basis, to predict impacts of transient acute phenomena, e.g., anoxic conditions similar to those observed in summer, 1976.

Socioeconomic Research and Monitoring

1. Profiles of vessel earnings, profits, and employment (fishery/industry).
2. Analysis of total demand for surf clams and ocean quahogs.

Suggested form of study/results: Quarterly compilation and yearly reports on 1. Baseline study and updates as needed on 2.

XVII. REFERENCES

All requests for background information, biological assessments, etc., should be directed to the offices of the Mid-Atlantic Fishery Management Council. References for the original Plan and previous Amendments are set forth in those documents. The references for Amendment #3 are:

- Gulland, J.A. 1971. The fish resources of the ocean. Fishing News (Books) Ltd., Surrey, England, 225 p.
- Jones, D.S. 1980. Annual cycle of shell growth increment formation in two continental shelf bivalves and its paleoecological significance. *Paleobiology* 6(3); 331-340.
- Mid-Atlantic Fishery Management Council. 1977. Surf Clam and Ocean Quahog Fishery Management Plan. 42 FR 60438.
- _____. 1979. Amendment #2 for the Surf Clam and Ocean Quahog Fishery Management Plan. 44 FR 68872.
- _____. 1980. Fisheries Socio-Economic Inventory. Prepared by Marine Group, Development Sciences, Inc., in association with Robert J. Harmon and Associates, Inc.
- Murawski, S.A., and F.M. Serchuk. 1979a. Dynamics of ocean quahog, Arctica islandica, populations off the Middle Atlantic coast of the United States. NMFS, NEFC, Woods Hole Lab. Ref. Doc. No. 79-16, 24 p.
- _____. 1979b. Distribution, size composition, and relative abundance of ocean quahog, Arctica islandica, populations off the Middle Atlantic coast of the United States. ICES CM 1979/K: 26, 22 p. (mimeo).
- Murawski, S.A., J.W. Ropes, and F.M. Serchuk. 1980. Growth studies of the ocean quahog, Arctica islandica. ICES CM 1980/K: 38, 24 p. (mimeo).
- Serchuk, F.M. and S.A. Murawski. 1980a. NMFS, NEFC, Woods Hole Lab. Ref. Doc. No. 80-33.
- _____. 1980b. NMES, NEFC, Woods Hole Lab. Ref. Doc. No. 80-32.
- Thompson, I., D.S. Jones, and D. Dreibelbis. 1980. Annual internal growth bandings and life history of the ocean quahog, Arctica islandica (Mollusca: Bivalvia). *Mar. Biol.* 57: 25-34.

SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

AMENDMENT #3 TO THE SURF CLAM AND OCEAN QUAHOG FISHERY MANAGEMENT PLAN

January 1981

Revised 10 June 1981 and 7 December 1981

This Supplemental Environmental Impact Statement (SEIS) relates to Amendment #3 to the Surf Clam and Ocean Quahog Fishery Management Plan (Plan). That Plan took effect 17 November 1977 and has previously been amended to extend it through 31 December 1981. The recommended alternative is to extend the Plan indefinitely; to institute a process for annually estimating Optimum Yield, Domestic Annual Harvest, and Domestic Annual Processing for surf clams and ocean quahogs; to institute a permit limitation system in the Mid-Atlantic surf clam fishery; and to make other changes in the surf clam management regime.

The area affected by the proposed action is the Fishery Conservation Zone (FCZ) of the northwest Atlantic Ocean.

Further information on the SEIS can be provided by:

Mr. John C. Bryson, Executive Director
Mid-Atlantic Fishery Management Council
Room 2115, Federal Building
North and New Streets
Dover, Delaware 19901

(302) 674-2331

- LEAD AGENCY -

Mid-Atlantic Fishery Management Council
Room 2115, Federal Building
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- COOPERATING AGENCIES -

Northeast Regional Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
US Department of Commerce
14 Elm Street
Gloucester, Massachusetts 01930

New England Fishery Management Council
Suntaug Office Park, 5 Broadway (Rt. 1)
Saugus, Massachusetts 01906

Final date by which comments on the draft must be received: 8 June 1981.

SUMMARY

Description of the Action

The MFCMA, enacted and signed into law on 13 April 1976, established a Fishery Conservation Zone (FCZ) and provided exclusive US regulation over all fishery resources except highly migratory species (i.e., tuna) within the FCZ. The Surf Clam and Ocean Quahog Plan was approved by the Secretary of Commerce in November, 1977, for the period through September, 1979. An EIS was prepared in conjunction with the Plan. Amendment #1 extended the Plan through 31 December 1979 and revised reporting requirements to bring them in compliance with the amended MFCMA. Amendment #2 extended the Plan through the end of calendar year 1981. Amendment #3 would extend the Plan indefinitely.

The objectives of the Plan are:

1. Rebuild the surf clam populations to allow eventual harvest approaching the 50 million pound level, which is the estimate of maximum sustainable yield over the range of the resource, based on the average yearly catch from 1960 to 1976.
2. Minimize short-term economic dislocations to the extent possible consistent with objective 1.
3. Prevent the harvest of ocean quahogs from exceeding maximum sustainable yield and direct the fishery toward achieving Optimum Yield.
4. Provide the greatest degrees of freedom and flexibility to all harvesters of these resources consistent with the attainment of the other objectives of this Plan.
5. Optimize yield per recruit.
6. Increase understanding of the conditions of the stocks and fishery.

The management unit of the Plan remains unchanged and is all surf clams (Spisula solidissima) and all ocean quahogs (Arctica islandica) in the Atlantic FCZ.

Alternatives for Amendment #3 are:

1. Take no action at this time. This would mean that the Plan would lapse on 31 December 1981 unless extended by a Secretarial Amendment.
2. Continue the provision to close areas with large numbers of small surf clams, impose a 5.5" surf clam size limit, continue annual and quarterly quotas, and continue the effort restrictions in the current Plan. The ocean quahog regime would be continued unchanged.
3. Remove effort restrictions.
4. Revise the fishing week, bad weather make-up day, and effort restrictions.
5. Institute a permit limitation system in the surf clam fishery.
6. Create two Mid-Atlantic surf clam management areas.
7. Create separate management areas for reopened surf clam areas.
8. Continue the provision to close areas with small surf clams, impose a 5.5" surf clam size limit, continue annual quotas, and institute a vessel allocation system in the surf clam fishery.
9. Continue the provision to close areas with large numbers of small surf clams and impose a 5.5" surf clam size limit. The ocean quahog regime would continue unchanged.

The adopted alternatives, as revised following the public review process, are (2), (4), (5a), and (7). This

includes an indefinite extension of the Plan with annual and quarterly quotas for surf clams, an annual quota for ocean quahogs, and a 5.5" surf clam size limit in the Mid-Atlantic Area. The New England surf clam management area is continued. In the Mid-Atlantic Area, the surf clam quarterly quotas are equal. The bad weather make-up day is in effect during November through April. The fishing week begins at 6:00 am on Sunday and ends at 6:00 pm on Thursday (under certain conditions it may begin at 12:00 am Sunday). Effort restrictions are set by the Regional Director to ensure fishing throughout a quarter with the minimum chance of closure while also minimizing effort changes during the quarter. A permit limitation system will be imposed in the Mid-Atlantic surf clam fishery. Areas closed for containing concentrations of small surf clams, when reopened, will have allowable catches separate from the overall quota and appropriate effort restrictions will be imposed in such areas to ensure that the harvest of the allowable catch will extend throughout a predetermined time period. Fishermen will be required to advise the NMFS if they want to fish in a reopened area. The annual quota, Domestic Annual Harvest, and Domestic Annual Processing will be set annually through a consultative process. For surf clams the values are between 1.8 and 2.9 million bushels (approximately 30 - 50 million pounds of meats) for the Mid-Atlantic Area and 25,000 - 100,000 bushels (approximately 425,000 - 1,700,000 pounds of meats) for the New England Area. For ocean quahogs, the values are between 4.0 and 6.0 million bushels (40 - 60 million pounds of meats).

All vessels with valid permits issued pursuant to the moratorium on entry of new vessels into the Mid-Atlantic Area surf clam fishery as of the beginning of 1982 will receive new permits under the permit limitation system. These vessels are required to harvest a minimum of 2,500 bushels of FCZ clams (i.e., FCZ surf clams or ocean quahogs) annually to receive a permit for the subsequent year. Permits of vessels that do not meet that criterion may be issued to new vessels at a ratio of 1 new vessel for every 4 permits not reissued. That process continues for a total of 5 years (i.e., 1982 - 1986). Beginning with the sixth year (1987) the total number of permits that may be issued in any year may not exceed the number of permits issued (outstanding) at the end of 1986. Beginning in 1987, a new permit may be issued for every permit not reissued because a permitted vessel did not meet the harvest criterion.

Summary of Impact

The recommended alternative will provide for the long term viability of the surf clam and ocean quahog resources while minimizing negative impacts on the surf clam fishery and permitting the ocean quahog fishery to develop fully.

Alternatives

The alternatives for Amendment #3 are outlined above and discussed and evaluated in Section XII of Amendment #3.

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PURPOSE OF AND NEED FOR THE PROPOSED ACTION

The Mid-Atlantic Fishery Management Council prepared this Amendment to the Surf Clam and Ocean Quahog Fishery Management Plan to incorporate the results of new stock assessments for surf clams and ocean quahogs. Quotas for those resources have been developed based on these assessments and management measures have been revised.

ALTERNATIVES INCLUDING THE PROPOSED ACTION

The alternatives including the proposed action are listed in Section XII-2 of Amendment #3. They are analyzed in Sections XII-3 and XII-4 of Amendment #3.

AFFECTED ENVIRONMENT

The environment affected by this Amendment is the FCZ of the northwestern Atlantic Ocean. It is described in Section VI of Amendments #3 and #2, and Section V of the Plan.

ENVIRONMENTAL CONSEQUENCES

Direct Effects and Their Significance

The proposed optimum yields of surf clams and ocean quahogs take into account the most recent scientific information on these species, stock assessments, and available information on the effects of fishing on resource abundance. No significant long-term adverse effects on surf clam and ocean quahog abundances are expected to result from the proposed action. It must be noted, however, that sufficient data are not available to make precise estimates of the effects of the proposed actions, nor is it possible to anticipate or prevent drastic declines in abundance caused by changes in the natural environment. For these reasons, improved monitoring and assessments of these stocks are critical. As new information becomes available, modifications of the Plan may be necessary.

The recommended alternative should have positive economic impacts on the fishery relative to the current Plan since harvest levels can be increased over current levels, the fishing week is expanded, the bad weather make-up day provision is expanded to six months, and the moratorium on entry of new vessels into the surf clam fishery is replaced by a limited entry system. The Plan should maintain long-term resource availability and will provide some measure of stability to the affected industry.

The proposed management measures contained in this Plan are designed to accomplish two goals: (1) provide for sustained optimum yields (recognizing, of course, the natural fluctuations in abundance), and (2) provide long-term economic stability in the fisheries. The process, if successful, will require short-term local sacrifices in terms of harvesting surf clams at a level below full fishing capacity. The relationship between the short-term use of the environment and the promise of long-term viability through stock population stabilization is a strong and necessary bond. Prudent and responsible utilization of the resources requires no less.

In essence, the purpose of the Plan is to control surf clam and ocean quahog harvest mortalities to ensure long-term productivity.

Indirect Effects and Their Significance

Sufficient data are not available to predict effects of the proposed action on total productivity of the region. To do so would require knowledge of the trophic interactions among surf clams and ocean quahogs and other species beyond our present understanding of living marine resources. Therefore, the proposed action is designed to result in continued yields on at least the present level based on the best scientific evidence available. Even so, it is impossible to completely forecast the long-term effects of the proposed action.

No irreversible commitments of resources will result from the implementation of this Amendment. Implicit in the implementation of the Amendment is the periodic monitoring of the catch to provide data for management decisions.

Biological Resources - No loss of aquatic flora or fauna populations has been identified. Periodic monitoring of the catch is required and the Plan is flexible and could be modified or amended if adverse impacts appeared.

Land Resources - No irreversible or irretrievable commitments of land resources have been identified in the proposed Amendment.

Water and Air Resources - No irreversible or irretrievable commitments of water and air have been identified.

Short-term irretrievable commitments of public funds, however, can be identified.

Surf clams and ocean quahogs are public resources and, therefore, belong to no one particular interest group. The concept envisioned by Congress as stated in the MFCMA is to conserve and manage the fisheries so as to maximize the benefits derived from these resources to all Americans. The species considered herein are treated much like any other natural resources of the public domain. Given these circumstances, the conservation measures proposed are examples of direct and responsible actions to ensure long-term resource availability at adequate levels for the foreseeable future.

Possible Conflicts Between the Proposed Action and the Objectives of Federal, Regional, State, and Local Land Use Plans, Policies, and Controls

Fishery Management Plans and Preliminary Management Plans

This Amendment is related to other fishery management plans and preliminary fishery management plans to the extent that all fisheries of the northwest Atlantic are part of the same general geophysical, biological, social, and economic setting. Domestic fishing fleets, fishermen, and gear often are active in more than a single fishery. Thus, regulations implemented to govern harvesting of one species or a group of related species may impact upon other fisheries by causing transfers of fishing effort. However, no conflicts are anticipated between this Amendment and other plans since the surf clam and ocean quahog fisheries generally operate independently of other fisheries with only rare transfers of fishermen from these to other fisheries. Because of the relatively isolated nature of the surf clam and ocean quahog fisheries, regulations promulgated pursuant to this Amendment should have no impact on other fisheries.

Marine Sanctuary and Other Special Management Systems

The USS Monitor Marine Sanctuary was officially established on January 30, 1975 under the Marine Protection, Research, and Sanctuaries Act of 1972. Rules and regulations have been issued for the Sanctuary (15 CFR Part 924). They 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 off the coast of North Carolina at 35°00'23" N latitude - 75°24'32" W longitude, in the Plan's designated management area. The Monitor Marine Sanctuary is clearly designated on all National Ocean Survey (NOS) charts accompanied by the caption "Protected area". This minimizes the potential for damage to the Sanctuary by fishing operations. In addition, the area is not known to contain clams.

State Coastal Zone Management (CZM) Programs

The CZM Act of 1972, as amended, is primarily protective in nature and provides measures for ensuring stability of productive fishery habitats within the coastal zone. Therefore, each state's CZM program will probably include the ecological principles upon which this Plan is based. It is recognized that responsible long-range management of both coastal zones and fish stocks must involve mutually supportive goals. Available CZM Programs were reviewed relative to this Amendment and no problems of consistency were identified. States in the region with approved CZM Programs are Maine, Massachusetts, Rhode Island, Connecticut, New Jersey, Delaware, Maryland, and North Carolina.

Oil, Gas, Mineral, and Deep Water Port Developments

While 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 Bureau of Land Management (BLM),

monitors OCS activities and has opportunity for comment as well as opportunity to advise BLM 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: (1) exclusion areas, (2) adverse impacts to sensitive, biologically important areas, (3) oil contamination, (4) substrate hazards to conventional fishing gear, and (5) competition for crews and harbor space. We are not aware of pending deep water port plans which would directly impact offshore fishery management goals in the areas under consideration, nor are we aware of potential effects of offshore fishery management plans upon future development of deep water port facilities.

Environmental Effects of Alternatives Including the Proposed Action

Alternatives (1) and (9) would have negative effects on the natural environment since (1) and (9) would lead to overfishing of the surf clam resource and (1) would lead to excessively rapid expansion of the ocean quahog fishery. The other alternatives have varying economic impacts on the harvesting and processing sectors. The environmental impacts of the proposed action should not differ significantly from the impacts of the current Plan for the following reasons:

1. The optimum yield ranges in the Amendment represent a departure from the approach used in the original Plan and in Amendment #2. Previously, Optimum Yields were set a point values rather than ranges. That approach required plan amendments to change the Optimum Yields and quotas. Amendment #3, by establishing Optimum Yield ranges, enables annual quotas to be set through an administrative process rather than by plan amendment, from values within the ranges. This revised approach to the quota setting process and the Optimum Yield ranges do not present negative environmental impacts because:
 - a. the upper bounds of the Optimum Yield ranges for Mid-Atlantic Area surf clams and for ocean quahogs are the same as the maximum sustainable yields;
 - b. the values for surf clams in the New England Area are relatively small so any resource impacts should be minimal even though little is known of the resource in that area;
 - c. the lower limits of the Optimum Yields are the same as the current quotas, which have resulted in no apparent negative impacts on the stocks; and
 - d. the Amendment provides that prior to setting the annual quotas, the latest stock assessments will be considered so that the latest available information will be used in setting the annual quotas.

In summary, using Optimum Yield ranges in a framework plan context is probably more safe from an environmental standpoint than using plan amendments because quota changes can be more responsive to stock changes. Since it takes more than a year to amend a plan and get the amendment approved, a significant amount of time can pass before a resource problem identified in an assessment can be reflected in an amended plan. The proposed system, at least within the established limits, permits quotas to be adjusted annually.

3. The surf clam size limit should act to increase the probability of future successful recruitment.
4. The provision to close areas which contain large concentrations of small surf clams, and the reopening criteria for such areas, provide a large measure of protection against destructive resource depletion.

The alternatives, including the proposed action, are evaluated in detail in Section XII of the Amendment.

Energy Requirements and Conservation Potential of Various Alternatives

The alternatives of no action and of direct allocations would be the most energy efficient relative to the harvesting sector since they would generally permit vessels in the surf clam fleet to operate in a more efficient manner than the recommended alternative which includes limitations on fishing days and times. However, the Council, as discussed in Section XII of the Amendment, believes that the no action alternative is totally unacceptable and that the direct allocation alternative is not feasible because it is probably impossible to develop an allocation system acceptable to the industry.

None of the alternatives appears to have particular energy impacts greater or less than any other on the processing sector.

Urban Quality, Historic, and Cultural Resources, and the Design of the Built Environment Including the Reuse and Conservation Potential of Various Alternatives and Mitigation Measures

These considerations do not appear to be significant relative to this Amendment.

LIST OF PREPARERS

This SEIS is based on Amendment #3 to the Plan. The Council's Surf Clam and Ocean Quahog Committee had supervisory responsibility for preparation of the Amendment. That Committee is made up of the following Council members: Russell A. Cookingham, Director, NJ Division of Fish, Game, and Wildlife; James E. Douglas, Jr., Commissioner, VA Marine Resources Commission; Robert J. Rubelmann, MD Department of Natural Resources; and Ricks E. Savage, commercial surf clam fisherman.

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The following members of the Mid-Atlantic Council staff had primary responsibility for the preparation of the Amendment and SEIS: John C. Bryson, P.E., MS, BS, Executive Director, had overall responsibility for the development of the Plan and all Amendments; David R. Keifer, MBA, BS, Planning and Administrative Officer, participated in the development of the Plan and coordinated the preparation of all Amendments; Anne D. Williams, MS, BS, Statistician, participated in the development of the Plan and all Amendments; and Stephen P. Freese, MA, BA, Economist, participated in the development of this Amendment, particularly with regard to the Regulatory Impact Review.

The following employees of NOAA and NMFS contributed to the preparation of the amended Plan and SEIS: Joseph J. Mueller, MBA, MS, BS, Economist, assisted the Council with the economic analysis and impact studies of the Plan and Amendments; Bruce Nicholls, AB, Industry Economist, is the NMFS Plan Coordinator for this Plan and assisted the Council with this and other Amendments; Liz Casey, Staff Attorney, Office of NOAA General Counsel, was the legal counsel assigned to the Council during the development of this Amendment; Dr. Fred Serchuk, Senior Assessment Scientist at the Northeast Fisheries Center, has prepared assessments for these resources for the last three years, and was responsible for the current assessment; and Stephen Murawski, MS, BS, Fishery Biologist (Research) at the Northeast Fisheries Center was involved with the preparation of the assessments used in this and other Amendments.

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APPENDIX II: LIST OF PUBLIC MEETINGS, SUMMARY OF PROCEEDINGS,
AND WRITTEN COMMENTS AND RESPONSES

<u>Location</u>	<u>Date</u>	<u>Number of Public Attending*</u>
Cape Charles, VA	18 May 1981	6
Salisbury, MD	19 May 1981	14
Wakefield, RI	20 May 1981	9
Wildwood Crest, NJ	21 May 1981	32

*Does not include State and Federal government representatives.

18 MAY 1981, CAPE CHARLES, VA

The hearing began at 7:15 p.m. Harry M. Keene (MAFMC) was the moderator. Others present were Jack Travelstead (Virginia Marine Resources Commission), Marian Huber (Corps of Engineers), Michael Haby (Virginia Tech. Sea Grant) and David R. Keifer (MAFMC staff). Six members of the public were present.

Mr. Keene reviewed Amendment #3 to the Surf Clam and Ocean Quahog FMP and the procedural rules for the hearing.

Mr. A. R. Myers indicated he favored alternative 5(a), the 5.5" size limit, the 6 A.M. Sunday start of the fishing week, increases to the quota, and the provision to close areas with small surf clams.

Mr. M. Parkowski indicated that American Original preferred the recommended alternative except that they preferred that the fishing week begin at midnight Saturday/Sunday so that boats fishing 18 hours could fish their full period and still land on Monday morning. American Original prefers continuation of the moratorium on entry of new vessels into the surf clam fishery, but if that is not possible, favors alternative 5(a). Mr. Parkowski submitted the attached paper (Attachment A) for the record.

The hearing was closed at 7:30 P.M.

19 MAY 1981, SALISBURY, MD

The hearing began at 7:10 P.M. Robert Rubelmann (MAFMC) was the moderator. Others present were Donald J. Leedy and Edith F. McClure (NMFS, Washington), Bruce Nicholls (Northeast Regional Office, NMFS), William E. Brey (NMFS, Easton, MD), Pam Lunsford (MD Tidewater Administration), and David R. Keifer (MAFMC staff). Fourteen members of the public were present.

Mr. Rubelmann reviewed Amendment #3 to the Surf Clam and Ocean Quahog FMP and the procedural rules for the hearing.

Mr. Nichols indicated that NMFS feels that some type of formula is needed to set annual quotas to minimize the latitude available to the Regional Director.

Mr. Rubin indicated that he believes that there is an inconsistency between the 4.5" criterion for area closures and the 5.5" surf clam size limits and feels that this inconsistency should be resolved by having both values either 4.5" or 5.5".

Mr. Fox stated the surf clam size limit should be 5.05".

Mr. Quillen indicated that the closure criterion and the size limit should be 5.5".

Five other individuals indicated they agreed with this position.

Mr. Parkowski indicated that American Original generally favored the recommended alternative except that the fishing week should begin at midnight Saturday/Sunday and, if the moratorium cannot be continued, alternative 5(a) is preferable to alternative 5(b). Messrs. Rubin and Drewer favored the 6 A.M. Sunday starting time.

Mr. Leonard indicated that the bad-weather make-up day should be in effect throughout the year. He felt that the provision to thin closed areas would not work. He also indicated that there is no need to limit entry.

Mr. Rubin also indicated that entry should not be limited since he feels that it is unfair to independent processors.

Mr. Wayne Watson favored alternative 5(a).

Messrs. Drewer and Quillen felt the Plan should provide for closure of areas with small surf clams, a 5.5" surf clam size limit, alternative 5(b), and the bad-weather make-up day for 6 months.

Mr. Farlow indicated that improved enforcement is needed to make any of the alternatives work.

Mr. Rubin indicated that he felt that actual landings from the Mid-Atlantic FCZ in 1980 totalled 70 million pounds of surf clams and he anticipated actual landings in 1981 will total 90-100 million pounds.

Messrs. Tony Watson and Rubin indicated that the quotas should be increased as much as possible.

The hearing was closed at approximately 8:30 P.M.

20 MAY 1981, WAKEFIELD, RI

The hearing began at 7:20 P.M. Mr. Harry M. Keene (MAFMC) was the moderator. Others present were David Borden (RI Fish and Wildlife), Kenneth L. Beal (NMFS Northeast Regional Office), and David R. Keifer (MAFMC staff). Nine members of the public were present.

Mr. Keene reviewed Amendment #3 to the Surf Clam and Ocean Quahog FMP and the procedural rules for the hearing.

Mr. Dykstra stated that he objects to the entire Plan. The regulations do not carry out the objectives of the Plan. There is no justification to limit entry. He favors time/area closures to protect small individuals or areas. He is opposed to limiting entry, quotas, and effort limits. He feels that the Plan restricts the choices of New England fishermen and, therefore, possibly creates economic inefficiency. The Plan discriminates and protects those in the industry now. He feels that economic stress in a fishery is part of the American free enterprise system. He feels that the biology in the Plan does not justify restrictions on landings.

Mr. Borden indicated that there should be no surf clam size limit in the New England Area. The 25,000 bushel quota in the New England Area is restraining on the development of the New England fishery. He objects to including New England in the ocean quahog quota because the quota is based on Mid-Atlantic data. He objects to both alternatives 5(a) and 5(b) because New England boats would be required to travel to and fish in the Mid-Atlantic Area to meet the harvesting criterion. There should be no ocean quahog quota for New England because, if there are effort limits imposed in the ocean quahog fishery, they could harm New England fishermen.

Mr. Allen felt that Mid-Atlantic boats should not be permitted to fish in the New England Area.

Mr. Parkowski indicated that American Original endorsed a separate New England Area and the recommended alternative except that the surf clam fishing week should begin at midnight Saturday/Sunday so that 18 hour boats could fish their entire period but still land on Monday. He felt that alternative 5(b) was not justified economically and could increase economic problems in the fishery. He submitted the attached statement for the record (Attachment B).

Mr. Brayon indicated that there is little biological data in the Plan and, therefore, the only justification for the Plan must be economic.

Mr. Allen objected to limiting entry and indicated that limited entry cannot be used only for economic reasons.

Mr. Smith indicated that New England fishermen should not be required to fish in the Mid-Atlantic to satisfy the landing criterion under the entry limitation alternatives.

Mr. Escalera indicated that the entry limitation alternatives do not achieve the objectives of the Plan because they do not promote conservation. The New England surf clam quota is too low. The requirement that New England boats must fish in the Mid-Atlantic to meet the harvesting criterion is not energy efficient.

The hearing was closed at approximately 8:30 P.M.

21 MAY 1981, WILDWOOD CREST, NJ

The hearing began at approximately 7:15 P.M. Council Chairman David H. Hart was the moderator. Also present were Bruce Halgern and Robert P. Winkel (NJ Division of Fish, Game, and Wildlife), Bruce Nicholls and Kevin W. Heying (National Marine Fisheries Service), Dr. Harold H. Haskin (MAFMC S & S Committee and Rutgers Univ.), and David R. Keifer (MAFMC staff). 32 members of the public were present.

Messrs. Hart and Keifer reviewed Amendment #3 to the Surf Clam and Ocean Quahog FMP.

Mr. D. Cohen recommended that the surf clam size limit should be 5", not 5.5".

Mr. Pearson stated that the size limit will result in mortality to clams not landed.

Mr. M. Cohen supported the 5.5" size limit.

Mr. Matthews stated that the quota should be increased. He does not agree with the size limit.

Mr. Madsen stated that the plants control catch rates and demand will prevent overfishing and catching small clams.

Mr. McVey indicated that the size limit could lead to more allowable fishing time. Catching small clams results in the quota being harvested quicker.

Mr. Schoffler stated that the size limit should not relate to economics and there should be two quotas: 1 for clams 5.5" and larger and 1 for smaller clams.

Mr. D. Cohen stated that the Plan should provide for quota increases during the year in order to prevent closures.

Mr. Isaksen stated that independent boats could be cut off by processors and, hence, not meet the harvesting criterion under the proposed entry limitation systems, but

he favored some type of entry limitation.

Mr. Mathews stated that the area north of Atlantic City should have a separate quota to minimize impacts if there is another anoxia problem.

Mr. D. Cohen stated that alternative 5(b) is unfair and that alternative 5(a) is the least unfair.

Mr. Matthews recommended that there be no closures during a year, but that any necessary closures be made at the end of the year.

Fifteen individuals indicated they were opposed to the 5.5" surf clam size limit, but some individuals favored a smaller size limit.

Mr. Patterson preferred a smaller size limit or vessel allocations.

Mr. Isaksen also favored vessel allocations.

It was also suggested that enforcement policies should be set forth in the Plan and that the moratorium should remain in effect until the annual quota reached 50 million pounds.

The hearing was closed at approximately 9:00 P.M.

STATEMENT OF THE AMERICAN ORIGINAL CORPORATION -
PUBLIC HEARING ON DRAFT AMENDMENT NO. 3 TO THE
SURF CLAM AND OCEAN QUAHOG FISHERY MANAGEMENT PLAN

The American Original Corporation at this time wishes to take the opportunity to generally endorse the alternative recommended by the Mid Atlantic Fishery Management Council and Council Staff regarding Amendment No. 3 to the Surf Clam and Ocean Quahog Fishery Management Plan. Of the nine alternatives set forth in the Draft Amendment and Draft Supplemental Environmental Impact Statement as revised and dated February 20, 1981, the American Original Corporation is in agreement that the best means of regulating the resource and the industry would be through adoption of portions of Alternatives 2, 4, 5 and 7. It is important to note that after extensive study and discussion this recommended alternative has received the support of the industry Advisory Sub Panel and represents in basic concept a continuation of the only system suited to compromise among the diverse and competing interests present in the fishery.

The combination encompassed in the recommended alternative involves continuation of annual and quarterly quotas for surf clam and an annual quota for ocean quahogs. Also, the surf clam quarterly quotas would be equal. Although there is some concern regarding months during which bad weather make up days would be allowed, the American Original Corporation supports the compromise reached by the

Surf Clam and Ocean Quahog Advisory Sub Panel that bad weather make up days be allowed during the months of November, December, January, February, March, and April. The American Original Corporation is however opposed to the recommendation that the fishing week begin at 6 a.m. on Sunday and end at 6 p.m. on Thursday. In instances where eighteen (18) hour fishing periods are permitted, the fishing week should be allowed to begin at midnight on Saturday. Such a measure would involve the following:

1. Existing shucking capacity could be more economically utilized if a constant finishing time for fishing is maintained. For example, shifting the starting time for the 18 hour trip avoids multiple shifts for shucking plant operations.

2. Maintenance of a constant finishing time for fishing would allow for certain product quality benefits, particularly during summer months.

3. A fixed starting time as compared to a fixed finishing time would be inequitable to vessel operators electing to utilize 18 hour trips in that such a choice could be frustrated or precluded by the shucking plant operator.

4. Prior to adoption of the management plan the boat segment of the industry traditionally worked from Sunday to Thursday.

The American Original Corporation is also in agreement that effort restrictions should be set by the Regional Director to insure fishing throughout the quarter to minimize any possibilities of closure. In such regard, it is suggested that the Regional Director be given considerable authority to borrow portions of the catch quota from subsequent quarters with such authority tied to an uncomplicated mechanism for increasing the annual quota through adjustments to the optimum yield. Management measures exercised to date have been deficient in that there has been a late response in restricting catch effort during high catch quarters with a resultant panic situation occurring upon announcement of possible fishery closure. Such announcements of closure cause an increased catch effort immediately prior to closure which only compounds the shortage problem and any closure which is placed in effect creates considerable economic harm and hardship to all segments of the industry, particularly processing plant workers who receive fixed wages and are subject to forced layoffs.

With respect to closure of areas containing concentrations of small surf clams, it is agreed that such action should be taken when warranted and that re-opening closed areas should be controlled through use of the recommended measures. In particular, it would be advisable to have a separate quota for re-opened areas so that any high catch levels for the re-opened area would not have the effect of causing an early closure during the particular quarter in which the area was re-opened. Likewise, the control of vessel access and fishing effort by time control would be the simplest and most effective means of administering the harvest in re-opened areas.

In this particular matter, a considerable amount of flexibility should be afforded the Regional Director in structuring and specifying the details of the re-opening requirement under the general conditions indicated.

Perhaps the most significant feature of the recommended alternative is the 5 1/2 inch clam size limit. The 5 1/2 inch size limit would serve the purpose of allowing for greater propagation of the species as well as more optimum utilization of the resource from a product standpoint. In reviewing the draft regulatory language as set forth in the proposed Section 652.25 entitled "Size Restrictions" it is apparent that several inconsistent standards have been specified, which, upon review in an enforcement setting, would be difficult to defend. For example, the regulation contains a strict prohibition regarding harvesting or possession of any surf clam smaller than 5 1/2 inches, while a separate standard is set forth for assessing violations in cases where both a 10% per cage limitation and a 240 clam standard count per cage have been exceeded. Also, it is not clear in the proposed regulation the location at which enforcement will be taken and the parties subject to and responsible for compliance with the requirement. In order to ensure effective enforcement of the size limitation, it is recommended that control of clam size be limited to a 10% exception for undersized clams by cage count and that a 240 undersized clam count per cage be used as the only standard. Any reference to the 10% per cage basis underlying the 240 clam standard count should be contained in the preface of the regulation in order to explain the rationale for the clam count number utilized. Also, it should be indicated in the regulation that the requirement applies not only at dockside but also

at the processing plant and that processors are under an affirmative obligation to reject non-conforming shipments of clams.

With respect to the question of new entry of vessels into the surf clam fishery, The American Original Corporation is of the view that the moratorium should be continued until such time that there is a substantial increase in the optimum yield beyond the 3 million bushel per year level. It must be remembered that in 1974 the entire fishing fleet consisting of 98 vessels managed to catch approximately 5.5 million bushels of clams. When the initial management plan was adopted and the new entry moratorium placed into effect, there were in excess of 160 licensed vessels competing for the reduced available catch of 1.8 million bushels. In effect, the circumstances which prompted adoption of the new entry moratorium in the first instance have not changed. The basic fact of the matter is that there is in the surf clam fleet a substantial excess in fishing capability which is not being utilized because of the quota limitation, all of which represents a form of economic waste in terms of capital under utilization. This adverse economic condition could only be made more severe and impose additional hardship on the existing surf clam fishing fleet if a new entry system were to be adopted.

In any event, with respect to the alternatives suggested for limited entry, alternative 5(a) is considered preferable. Under alternative 5(a) an appropriate mechanism for eliminating excess license entitlements is set forth and the ratio for license replacement should be helpful in reducing the impact of increased fishing capability encompassed in new entry.

The American Original Corporation is also in agreement with the recommendation that the New England surf clam resource be managed as a separate area.

With respect to the other alternatives set forth, The American Original Corporation expresses the following views:

Alternative #1 which suggested no action be taken would amount to an abdication of responsibility on the part of the Council and is totally contrary to the legal requirements imposed upon the Council by the Fishery Conservation and Management Act of 1976.

Alternative #3 is opposed on the basis that closures would occur during certain quarters, thereby adversely impacting upon the fishing and processing sectors of the industry. Repeated closures and re-openings would also have a tremendous adverse impact in the marketplace in that gluts and shortages of finished product would occur with resultant added cost to the consumer to compensate for the inefficiency involved in matching product supply with demand.

Alternative #5(b) is opposed on the basis that it would lead to an overall increase in fishing capability in an industry which is already grossly over capitalized and which has excessive catch capability. The alternative inaccurately concludes that an increase in optimum yield would justify increased entry, however, there has been a failure to recognize the current adverse economic conditions which exist with respect to the active fishing vessels. By allowing vessels with greater catch capability to replace vessels leaving the industry would only compound an already critical problem. Also, the number of vessels allowed per increase level

in optimum yield appears to have no statistical basis or rationale and certainly ignores the critical factor of overall fleet fishing capability.

Alternative #6 involving the creation of separate surf clam management areas would serve to severely restrict the flexibility currently available to fishermen regarding the areas fished and would also pose problems regarding enforcement. It is also expected that the creation of two separate areas with separate criteria would impose a considerable burden on the limited government administrative resources currently available. It is also difficult to determine if such a measure would provide any benefit from a resource standpoint since elections to transfer areas could be made on a quarterly basis. In addition, under the system suggested, the anticipation of re-opening of closed areas could become a matter of chance which could preclude certain segments of the fishing sector of the industry from partaking in catches available in the re-opened areas.

Alternative #8 involving vessel allocations is opposed on the basis that no system of vessel catch allocation can be developed which is equitable and takes into account the myriad of factors involved in vessel catch. More importantly, after several years of labored discussion of the proposal, no method of allocating the catch has been considered acceptable by the various sectors of the fishing industry. The problems involved in a per vessel allocation system can be briefly summarized as follows:

1. A fixed per vessel allocation cannot take into account the fishing skill of a particular captain. In

many instances smaller vessels out-fish larger vessels because of this skill, and, by the same token, this catch skill currently can be transferred from vessel to vessel through transfer or change of employment of the captain. Adoption of Alternative #8 would eliminate this factor.

2. No adequate means has been developed to take into account the differences in capital requirements and debt service regarding the various vessels in the fleet. In particular, the catch capability reflected by a greater capital investment would be greatly diluted. Catch capability and share of catch would also be significantly affected by elimination of such capital related factors such as ability to fish during bad weather periods.

3. Since vessels involved in quahog fishing are licensed to catch surf clams it would be necessary to determine the allocation of surf clams available to such vessels even though the vessels were not involved in surf clam fishing. Any such allocation would in turn have to be taken from the amount of surf clams available to those vessels actively involved in surf clam fishing, thus creating an imbalance in the overall share of the total catch available to vessels engaged in surf clamming.

4. It would be necessary to determine the manner in which new vessels entering the fishery would be provided a catch allocation. Any such allocation would amount to a reduction of surf clam catch otherwise available to the existing surf clam fleet.

5. Any attempt to use historical catch as a basis for a vessel allocation would involve a number of inequities. For example, losses of time for repairs, lack of surf clam buyers, non-activity due to independent economic factors, and time spent on in-shore versus off-shore fishing could not be adequately taken into account. There are also considerable legal limitations on the ability to sell or transfer a catch allocation from both an anti-trust standpoint as well as the lack of authority to establish such a system under the provisions of the Fishery Management and Conservation Act of 1976.

6. The adoption of a per vessel allocation would have the effect of regulating the economics of the surf clam fishing industry. Inasmuch as regulations could be subsequently repealed or modified through either legal challenge or independent agency action, the questionable rights and entitlements reflected by a per vessel allocation system would be established on an infirm and indefinite foundation. In essence, the Fishery Management and Conservation Act of 1976 vests responsibility in the government to regulate the resource with incidental impact on the economics of the affected industry rather than the converse.

Alternative #9 which involves removal of the annual and quarterly quotas and effort restrictions reflects a no management approach which is contrary to the mandates set forth in the Fishery Management and

Conservation Act of 1976. Accordingly, adoption of such a measure would be contrary to the intent and purposes of the Act and represent an abdication of responsibility.

In summary, The American Original Corporation urges adoption of the recommended alternative which has been supported by the Surf Clam and Ocean Quahog Advisory Sub Panel, subject to the suggested modification regarding commencement of fishing time.

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In summary, The American Original Corporation urges adoption of the recommended alternative which has been supported by the Surf Clam and Ocean Quahog Advisory Sub Panel, subject to the suggested modification regarding commencement of fishing time.

SUPPLEMENTAL STATEMENT OF THE AMERICAN ORIGINAL CORPORATION - DRAFT AMENDMENT NO. 3 TO THE SURF CLAM AND OCEAN QUAHOG FISHERY MANAGEMENT PLAN

Prior to adoption of the initial Surf Clam and Ocean Quahog Management Plan, the fishing fleet, in 1974, consisting of 98 vessels, managed to catch approximately 5.5 million bushels of surf clams. When the Management Plan was adopted and the new vessel entry moratorium placed in effect, there were in excess of 160 licensed vessels entitled to catch an established annual quota of 1.8 million bushels of surf clams. At that time, it was clearly recognized that there existed in the surf clam fishery a gross excess of fishing capability and over-capitalization.

The action taken in establishing the moratorium on new vessel entry was based on specific authorization contained in Section 1853(b)(6) of the Fishery Conservation and Management Act of 1976 which provides as follows:

"...any fishery management plan which is prepared by the 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..."

In reviewing the legislative history of the referenced section of the Fishery Conservation and Management Act, it is pertinent to note that the provision regarding limitation of access appeared in both the House and Senate versions of what ultimately was enacted into law as Public Law 94-265. In fact, House Report 445 which accompanied the House version of the Bill at page 66 (2 U.S. Congressional and Administrative News 1976 at 634, 635) stated:

"The Plan could establish a system under which access to the fishery could be limited both as to foreign and domestic vessels and both as to recreational and commercial fishermen. If the system provided for limited entry, then consideration would be required to be given by the Council to such things as the present participation in the fishery concern, historical fishing practices, value of existing investments in vessels and gear, capability of existing vessels to engage in other fisheries and the history of compliance with any fisheries regulations imposed pursuant to this Act. "

The Senate Conference Report 94-711 (2 U.S. Congressional and Administrative News 1976 at pages 676, 677) address the limited entry matter as follows:

"In addition [to what each fishery management plan is required to include] councils may, at their discretion, include - (6) creation of a limited entry system based on past participation, economic dependence, existing investments and other factors, provided that a majority of the council members present and voting agree..."

Since the enactment of the Fishery Conservation and Management Act of 1976, there has been considerable legal commentary regarding

the basis for imposition of limited access systems. Generally, limited access systems are supported and justified on the basis of considerations of promoting economic efficiency in the fishing segment of the industry. For example, when there is a limitation on the amount of revenues that can be derived from a resource, which is the case when a catch quota is imposed, and when there exists in the fishery an excess of catch capability, any additional catch capability allowed into the industry represents economic waste in the form of committed capital and labor that could otherwise be used more efficiently in other more productive forms of enterprise in other segments of the economy. It has also been noted that under a limited entry system some mechanism should be employed which allows for elimination of excess users which are inefficient and which do not participate in the exploitation of the resource.

With respect to the alternatives set forth regarding limited entry in Draft Amendment No. 3, it is clear that Alternative 5(a) best meets the intent and objectives of the Fishery Management and Conservation Act of 1976. Under Alternative 5(a) new entry is tied to elimination of catch capability represented by inefficient and non-participating vessels on a 4 to 1 basis. It is likely that there would be an increased catch capability in this over-capitalized segment of the industry if Alternative 5(a) were adopted, however, this alternative is certainly preferable to Alternative 5(b) which would allow for a significant increase in catch capability based on established increases in the annual quota. It must be noted that

the proposed method of increasing licenses under Alternative 5(b) is without any statistical or rational justification.

In summary, the objective of promoting economic efficiency would better be served by continuing the moratorium on new vessel entry while eliminating inactive and unproductive fishing vessels, however, if a limited entry system is adopted, Alternative 5(a) represents the preferable approach. In considering this matter, it is urged that the Council not lose sight of the undisputed fact that there is a gross excess of catch capability existing in the current fleet which has led to distressed economic conditions under the current Management Plan -- this situation would only be compounded by any further increases in catch capability, capital investment, and commitment of labor to the fishing segment of the surf clam industry.

RESPONSES TO WRITTEN COMMENTS

US Coast Guard: It is the Council's intent that the size limit be enforced primarily at dockside. The Council recognizes the enforcement effort required by the recommended management regime, but believes that the measures recommended are necessary to achieve the objectives of the Plan. Section 652.8(b) has been revised so it is identical to 50 CFR 655.8(b).

US Fish and Wildlife Service: No response is needed.

North Carolina Dept. of Natural Resources & Community Development: No response is needed.

Atlantic Offshore Fish and Lobster Association: The Council believes that the recommended management regime is necessary to achieve the Plan's objectives and is based on the best data available. The entry limitation alternative has been revised to permit vessels to meet the harvesting criterion by fishing in the FCZ, not just in the Mid-Atlantic Area. The surf clam size limit provision has been revised to apply only to the Mid-Atlantic Area. The surf clam quota for the New England Area has been revised from 25,000 bushels to a range of from 25,000 bushels to 100,000 bushels.

Mid-Atlantic Seafoods: The Council believes that implementation of the recommended entry limitation system is appropriate at this time and that adequate time has passed since the implementation of the original moratorium so that vessels covered by the "grandfather" provision of the moratorium should have entered the fishery prior to the implementation of the new entry limitation system.

Old Salt Seafood Company: No response is needed.

Gorton's Brand Canned Seafoods Clam and Fish Products: The Council, after consideration of all comments of the industry, has adopted a 5.5 inch size limit for surf clams in the Mid-Atlantic Area in the final version on Amendment #3.

Nanticoke Seafood Co.: No response is needed.

American Original Corporation: No response is needed.

The Gorton Group: The Council, after consideration of all comments of the industry, has adopted a 5.5 inch size limit for surf clams in the Mid-Atlantic Area.

US Environmental Protection Agency: No response is needed.



DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

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16214.61

Mr. John C. Bryson
Executive Director, Mid-Atlantic Fishery
Management Council
North and New Streets, Federal Building Room 2115
Dover, Delaware 19901

RECEIVED

MAY 28 1981

Dear Mr. Bryson:

MID ATLANTIC COUNCIL

The Draft Amendment No. 3 for the Surf Clam and Ocean Quahog Fishery Management Plan (FMP), Draft Environmental Impact Statement (DEIS) and draft proposed regulations, dated January 15, 1981, has been reviewed. The comments in this letter are offered for your consideration before adopting any of the alternatives proposed in the amendment.

Current Coast Guard enforcement of the surf clam and ocean quahog regulations is directed toward vessel sightings rather than boardings. A patrol unit, either vessel or aircraft, upon sighting a surf clam or ocean quahog vessel identifies it, ascertains its position, and determines if it is fishing, drifting, underway, etc. The information is passed via daily radio message to the NMFS in Gloucester, MA, where it is checked to determine if the vessel was fishing legally. Only in cases of a gross violation, such as an unpermitted vessel or a vessel fishing in a closed area, would a patrol vessel take action on scene. Boardings are made only infrequently on a random basis.

To properly enforce an FMP such as this one requires extensive boardings. They are not being done due to an acute lack of resources in the area and the extreme difficulty in at-sea enforcement of these regulations. The variable fishing hours of each permitted vessel are confusing to the patrol units. Confirming or disproving that a vessel is fishing on an authorized make-up day requires hours to check. Any further effort restrictions serve only to exacerbate the problem.

The Joint NMFS/USCG Fisheries Enforcement Study of February 1980 established a requirement for boarding each surf clam/ocean quahog vessel once per month, with fifty percent of the boardings to be accomplished at sea. One hundred hours of aircraft overflight time per year were also required. A preliminary analysis of enforcement requirements for the Mid-Atlantic area has been completed. It indicates that 196 days of cutter time and 130 days of patrol boat time will be necessary to effectively enforce the plan. The approximate

Subj: Comments on Draft Amendment No. 3 for the Surf Clam and Ocean Quahog Fishery Management Plan (FMP), Draft Environmental Impact Statement (DEIS) draft proposed regulations dated January 15, 1981

cost of this enforcement in fiscal year 1979 dollars is \$2,219,000. As a comparison, 27 sightings and 2 boardings of surf clam/ocean quahog vessels have been conducted to date in 1981, equating to only about one cutter-day.

The following comments are specifically addressed to the alternatives covered in the plan in Section XII-2, pp. 38-43:

Alternative 2 would continue the present plan and impose a 5.5" surf clam size limit. The size limit is based on good scientific criteria, but cannot be practically enforced at sea. This provision would require that a boarding party measure hundreds, and possibly thousands, of clams on one vessel while the cutter stands by unable to investigate distant contacts or board vessels more than a few miles away, a gross waste of resource time.

Alternative 3 would remove effort restrictions other than quarterly quotas. This would streamline enforcement, would not require as many boardings as the present regime, and would make a sighting sufficient to determine compliance with the regulations. The two most difficult aspects of enforcement of the plan, weekly effort restrictions and bad weather days, would be eliminated. The possibility of early closures, due to the taking of quarterly quotas prior to the end of the period, will be increased. However, this could be offset by the desire of the industry to equalize catches throughout the quarter for the most efficient operation.

Alternative 4 revises the fishing week to add twelve hours on Sunday, adds two months to the time bad-weather make up days can be claimed, allows the vessel operator to make the determination after getting underway, and allows the Regional Director to regulate weekly fishing hours continuously. This alternative would not change the present level or method of enforcement but rather, would increase the resources required to effectively enforce the regulations.

The expansion of the fishing week will increase patrol requirements on the weekends when resources are already stretched due to search and rescue and other law enforcement missions.

The revised bad weather days would allow the vessel operator to decide not to fish even though he has already left the pier and still claim a weather-day provided he does not land clams. Bad-weather days would be in effect half of the year. This provision cannot be checked at sea.

Allowing the Regional Director to regulate fishing time throughout the quarter presents no problems to enforcement.

Subj: Comments on Draft Amendment No. 3 for the Surf Clam and Ocean Quahog Fishery Management Plan (FMP), Draft Environmental Impact Statement (DEIS) draft proposed regulations dated January 15, 1981

Alternative 6 would create two Mid-Atlantic surf clam management areas. Previous remarks regarding enforcement apply, as it adds another requirement to an already overburdened management regime. The dividing line between the two areas, if adopted, should be given in geographic coordinates rather than as a LORAN C line in order to conform to standard marine convention and to insure it is the same on all charts.

Alternative 7 would create separate management areas for reopened surf clam areas. This alternative has the same problems as Alternative 6. The Coast Guard does not provide observers for fishing vessels. The current remote monitoring device being considered, the Fishing Vessel Transmit Terminal (FVTT), is accurate to within one nautical mile and can transmit a position an average of 3.6 times per day; inadequate for the small areas involved. The FVTT will not be operational before 1982. The project is currently contemplated for use only with foreign fishing vessels.

The following comments on the proposed regulations are offered for your consideration:

It is recommended that Section 652.8(b) be revised to be similar to 50 CFR 655.8(b). This would more accurately reflect Coast Guard procedure in contacting vessels by VHF-FM radio (channel 16) to facilitate boarding.

The provision for the bad-weather make-up day in Section 652.22(a)(7) has already been commented on.

The requirements of Section 652.25 are too impractical to enforce at sea for the reasons already stated.

The opportunity to comment on this draft FMP amendment and DEIS is greatly appreciated. If you have further questions regarding this matter please feel free to contact LT Bill CHAPPELL of my staff at (202) 755-1155 commercial or FTS.

Sincerely,



R. W. CHRISTIANSEN
Commander, U.S. Coast Guard
Chief, Fisheries Law Enforcement Branch
By direction of the Commandant

Copy to:
COMLANTAREA (Aol)
CCGDFIVE (oil)
Mr. William G. Gordon, NMFS (F/CM)



UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

HARRISBURG AREA OFFICE
100 Chestnut Street, Room 310
Harrisburg, Pennsylvania 17101

RECEIVED

FEB 18 1981

MID ATLANTIC COUNCIL

February 10, 1981

Mr. John C. Bryson, Executive Director
Mid-Atlantic Fishery Management Council
Federal Building - Room 2115
North and New Streets
Dover, Delaware 19901

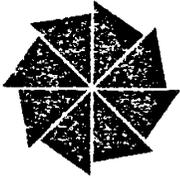
Dear John,

We have reviewed Draft Amendment No. 3 for the Surf Clam and Ocean Quahog Fishery Management Plan and Draft Supplemental EIS which accompanied your letter of February 4, 1981. We have no specific comments to make on these documents.

The section on potential impact on marine mammals and endangered species must be referred to Mr. Douglas Beach of the National Marine Fisheries Service, 7 Pleasant Street, Gloucester, Massachusetts 01930. National Marine Fisheries Service retains endangered species jurisdiction over whales, sea turtles, and the shortnose sturgeon.

Sincerely,

Richard A. St. Pierre
Assistant Area Manager for
Hatcheries and Fisheries



North Carolina Department of Natural
Resources & Community Development

James B. Hunt, Jr., Governor

Howard N. Lee, Secretary

DEPUTY SECRETARY

James A. Summers

Box 27687, Raleigh 27611
Telephone 919 733-4916

May 27, 1981

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JUN 1 1981

MID ATLANTIC COUNCIL

Mr. John C. Bryson, Executive Director
Mid-Atlantic Fishery Management Council
Federal Building, Room 2115
North and New Streets
Dover, Delaware 19901

Dear Mr. Bryson:

The State has completed a review of draft amendment No. 3 for the Surf Clam and Ocean Quahog Fishery Management Plan and associated draft environmental impact statement. The State does not usually take positions on projects at the draft stage, however, since neither our Division of Marine Fisheries nor our Office of Coastal Management personnel can foresee any impacts of the amendment to North Carolina's fishermen or fishery, a consistency determination will not be necessary. Therefore, as long as the proposal is not substantively changed during preparation of the final EIS, the State will support the proposed amendment.

Any substantive change to the amendment which affects North Carolina's commercial fishery would result in the need for a new review and may require a revised state position.

If there are any questions concerning this matter, please contact me.

Sincerely,

James A. Summers

cc: Office of Coastal Management
Marine Fisheries

JAS:hm:3569



ATLANTIC OFFSHORE FISH & LOBSTER ASSOCIATION

1 Washington Street Newport, R. I. 02840

RECEIVED

21 May 1981

MAY 25 1981

Mr. John Bryson
 Executive Director
 Mid-Atlantic Fisheries Management Council
 Rm 2115, Federal Building
 North and New Streets
 Dover, DE 19901

MID ATLANTIC FISHERIES MANAGEMENT COUNCIL

Dear Mr. Bryson:

This letter is in response to notice given in the Federal Register that comments relative to the proposed SURF CLAM & OCEAN QUAHOG PLAN be directed to your office.

As a representative of our organization, which is the largest regional organization of Fishermen in New England which engage in fishing in the FCZ, I Attended the public hearing at Government Center, Wakefield, RI on 20 May 1981.

This Association would like to make the following comments and observations about the proposed plan:

- o The plan is overly restrictive without Biological data to justify the stringent restrains on entry and effort.
- o The plan advocates use of management methods which are considered to be the last in choice to be invoked, and the first to be removed when a fish species is showing no signs of difficulty, ie. Limited Entry.
- o The plan discriminates against the New England Fisherman in that he is restricted from fishing in Mid-Atlantic waters, while at the same time the Mid-Atlantic Fisherman is authorized to fish in both areas. This action is viewed as being totally economic in nature and not supportive of the primary objective of FMP's as outlined in the FCMA.
- o Amendment # 3 states as its first objective, "To prevent the exploitation of these resources from exceeding those levels which reduce the probability of successful recruitment to the fishery". The requirements of minimum effort to retain a license are considered to be in contradiction to that objective in that they require that pressure continue to be exerted on the species in order to retain a license.
- o The plan is in contradiction to other stated objectives of the Federal Government, namely Energy Conservation. The requirement that New England Fishermen catch a minimum amount of surf clams in Mid-Atlantic waters in order to retain a license dictate high and inordinate requirements of fuel for transit. If and when the New England Fisherman fails to comply with this requirement, the option is then given to Mid-Atlantic Fishermen to transit into New England waters and harvest the species. This is also advocating high energy consumption.

- o The plan lacks flexibility. Quota management as dictated in the plan is not responsive to changes in the fish stocks. We in New England have had experience with a plan, GROUND FISH, which is inflexible and the consequences which this brings about to the fisherman and regulatory agencies alike.
- o The requirement for minimum size is viewed as unenforceable. This condition gives rise to brinksmanship and total disregard for the requirement.
- o The plan is not reflective of the stated position of our present administration, of DEREGULATION, indeed it supports over-regulation.
- o The quotas proposed, which are considered to be inordinately restrictive without Biological support, are discriminating to the New England Fisherman. If indeed the stocks require the implementation of such quotas, the comparative balance between that assigned to the Mid-Atlantic Fisherman, and that allotted to the New England area are blatantly skewed and biased in favor of the Mid-Atlantic Fisherman, a condition which goes beyond protection of a species.
- o Survey data obtained in the Mid-Atlantic FCZ and in Long Island Sound has been projected into New England Waters without any basis of fact.
- o The plan is viewed as being weighted too heavily in efforts to influence economic viability in the fishery by those already permitted to participate in the fishery, rather than primarily to address longevity of the stock.

Based on the foregoing rationale, this Association does not support the plan as proposed and for the record states an objection to the plan in its present form.

Sincerely,

Daniel Escalera
Manager

MID-ATLANTIC SEAFOODS

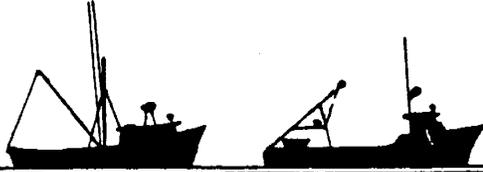
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MAY 20 1981

MID ATLANTIC COUNCIL

Crisfield, MD 21817
P. O. Box 710
(301) 968-2765

Freeport, Long Island, NY 11520
296 Woodcleft Avenue
(516) FR9-0615



Mr. John C. Bryson , Executive Director
Mid-Atlantic Fishery Management Council
Federal Building , Room 2115
Dover , Delaware 19901
(302) 674- 2331

Certified Mail
Wash , DC

20 May 1981

Dear Sir;

In accordance with " Request for Comments " Re: Covering Letter of 16 April 1981 of Proposed Draft Amendment No. 3 . Ocean Clam Fisheries of the United States , it is a matter of record that Mid-Atlantic Sea-Foods has GRP Vessels under construction which , upon Completion and Documentation , have been determined entitled to Federal Surf Clam Harvesting Permits.

Government has determined without test to date that only domestic interests with prior rights in the U.S. Clam Trade have been eligible for Federal Harvesting Permits. Current Federal Regulations , Economic situations UNIQUE TO THIS TRADE and other negative factors have already created considerable Hardship to all existing permitted Vessels and Crews in this trade.

Prior to ANY CHANGES WHATSOEVER in the present permit system , or proposal of any NEW SYSTEMS of further Federal Regulation of permitting vessels to work in their existing Trade , effort restrictions should be relaxed to the point of eventual FULL EMPLOYMENT of all current permit resources (Vessels), all of whom have suffered under EXTREME FEDERAL REGULATIONS since their inception in Fall 1977 . Even when Quotas are eventually restored to the former Harvesting levels or Higher, the same principal of FULL EMPLOYMENT FIRST should , as a basic principle , apply to all existing Permits , which will also solve MANY OF THE OTHER "ILLS" OF THE EXISTING SYSTEM , which has not sufficiently matured yet to change at this time.

It is the opinion of Mid-Atlantic Seafoods that NO CHANGES be made with regard to current U.S. Clam Harvesting Permit (Grandfather) Rights , until DE-REGULATED FULL EMPLOYMENT of all current Vessels can no longer achieve the Annual Harvest "Quota" .

Sincerely

Red Long
Mid-Atlantic Seafoods

Copy to:

Joyce M.T. Wood
Director
Office of Ecology and Conservation

APP II 37



Seafood Company

June 3, 1981

Mr. John C. Bryson
Mid-Atlantic Fisheries Management Council
Federal Building-Room 2115
North & New Streets
Dover, Delaware 19901

Dear John:

Old Salt Seafood Company would very much like to lend its support to the recommended alternatives for Amendment No. 3 to the Surf and Ocean Quahog Management Plan.

We feel our industry is in dire need of some relief in terms of the present bushel quota on Surf clams. As you know, we are now borrowing bushels from subsequent quotas in an effort to keep our doors open and our customers satisfied.

It is our feeling that the Surf clam fishery can stand additional fishing pressure without jeopardizing future stocks.

We very much need relief at this time, and I hope you will give every consideration to our request and that of industry to modify or to accept the alternatives suggested to the Management Plan.

Thank you.

Sincerely,

William H. Shields, Jr.
Executive Vice President

WHS, Jr. /pjk

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JUN 3 1981

MID ATLANTIC COUNCIL

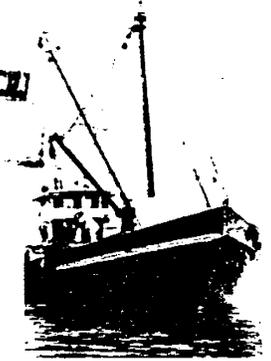


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JUN 8 1981

GORTON'S
BRAND
CANNED SEAFOODS
CLAM AND FISH PRODUCTS

MID ATLANTIC COUNCIL



RIGGIN & ROBBINS
THE GORTON GROUP
GENERAL MILLS, INC.
GORTON ROAD, P.O. BOX 309
MILLVILLE, NEW JERSEY 08332 • PHONE: 609/825-8111

June 4, 1981

Mr. John C. Bryson, Executive Director
Mid-Atlantic Fishery Management Council
Federal Building, Room 2115
North & New Sts.
Dover, Delaware 19901

Dear John,

We wish to inform you, that our Company does not agree with the proposed five and one-half inch (5½") surf clam size regulation. We are dredging and processing, four and one-half inch (4½") surf clams from the Atlantic City area, one day a week. (110 cages per week)

If we were forced to dredge five and one-half inch (5½") surf clams, our boats would suffer production loss, and the price would increase two (2) to three (3) dollars per bushel.

We think the best way to regulate a resource, is by closure or designated hours per day. A size limit would require policing of the entire clam fleet, which would create arguments, fights, law suits and arrests.

Very truly yours,
William H. Riggin
W. H. Riggin
Riggin & Robbins

WHR/v1
cc: U.S. Dept. of Commerce
National Marine Fisheries Service

RECEIVED

JUN 8 1981

NANTICOKE SEAFOOD CO. MID ATLANTIC COUNCIL

FROZEN SEAFOOD
NANTICOKE, MARYLAND 21840 • (301) 873-2811

June 4, 1981

Mr. John C. Bryson, Executive Director
Mid-Atlantic Fishery Management Council
Room 2115 Federal Building
North and New Street
Dover, Delaware 19901

Dear Mr. Bryson;

On behalf of the Nanticoke Seafood Company, Nanticoke, Maryland, I am responding in writing to draft amendment number three for the surf clam and ocean quahog fishery management plan.

Under alternatives for amendment number three, I strongly recommend that emergency regulations be imposed immediately to enforce item number nine. If these emergency regulations are not acted upon and passed immediately, I fear for the survival of the breaded clam strip processors.

Several companys who were using only ocean quahogs, as well as several others who were using only large surf clams, have now begun to catch and process the more abundant small, under five inch, surf clams. These small surf clams are being caught in such large quantities that it is quite possible the entire quota allocated for the third quarter of 1981 may be caught before the end of the second quarter of 1981. If this happens, and the fishery is closed, the companys who were previously catching and using quahogs could go back to that resource with little or no interruption in their business. This is not true for the breader of surf clam strips. To produce the quality product that the consumer demands, only larger surf clams, five and one-half inches and up may be used. Small surf clams or ocean quahogs cannot be used for breading. We would be completely shut down for the duration of the closure and literally hundreds of people would be put out of work.

To prevent this from happening, and to insure the survival of the industry, I again recommend the immediate approval of emergency regulations dealing with the closure of areas with large numbers of small surf clams and the imposition of a five and one-half inch surf clam size limit.

Sincerely

c.c. Allen Peterson
Joyce M. T. Wood

Samuel M. Quillin
General Manager



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JUN 8 1981

MID ATLANTIC COUNCIL

THE AMERICAN ORIGINAL CORPORATION

P.O. BOX 769, 215 HIGH STREET, SEAFORD, DELAWARE 19973
PHONE: (302) 629-3081 - TWX: 510-664-2326

June 8, 1981

Mr. John C. Bryson
Executive Director
Mid-Atlantic Fishery
Management Council
North New Street
Dover, DE 19901

Re: Written Comments - Draft Amendment
No. 3 for the Surf Clam and Ocean
Quahog Fishery Management Plan and
Draft Supplemental Environmental
Impact Statement

Dear Mr. Bryson:

In addition to statements presented at the various public hearings conducted regarding the above-referenced matter, The American Original Corporation hereby provides written comments which highlight some of the matters subject to discussion and consideration at the public hearings.

The American Original Corporation endorses the recommended portions of alternatives 2, 4, 5(a), and 7, subject to the following qualifications:

1. Discretion should be afforded to the Regional Director to allow for fishing time to commence on midnight Saturday (i.e., 0001 hours Sunday) in instances where 18 or 36 hour fishing periods are allowed. Such a measure would allow for processing on Mondays during such fishing periods. It should be noted that this measure has been endorsed by the Industry Advisory Subpanel and it is

Mr. John C. Bryson
June 8, 1981
Page Two

urged that the measure be included as part of the recommended alternative.

2. With respect to alternative 5, it would be preferable to continue the moratorium and include a provision requiring a minimal annual catch of 2500 bushels of surf clams or ocean quahogs in order to maintain a license. Such a measure would allow for the elimination of phantom and non-using license holders while allowing for surf clam fishing on even a part-time basis. Justification for maintaining the moratorium is founded on the well known fact that there exists within the surf clam fishing industry a tremendous excess of capitalization and catch capability. In submitting this recommendation, it should be noted that The American Original Corporation does not oppose the proposal of the Industry Advisory Subpanel that alternative 5(a) be adopted. Alternative 5(a) is considered much preferable to alternative 5(b) which would allow for much greater increase in capitalization and catch capability without any rational basis. With respect to the requirement for New England vessels to catch at least 2500 bushels of surf clams or ocean quahogs under alternative 5(a) there is agreement that it should be possible for the New England vessels to catch the required quantity of surf clams and ocean quahogs in the New England region.

The American Original Corporation also wishes to reiterate its support for the 5 1/2 inch surf clam size limit. With respect to the adoption of such a measure, it is recommended that a 10% tolerance per cage be allowed and that a 240 clam per cage exception

Mr. John C. Bryson
June 8, 1981
Page Three

be provided for undersized clams. The 5 1/2 inch size limit is well justified on the basis that the median harvested clam size is in excess of 6 inches and that there are sufficient quantities of clams in excess of the 5 1/2 inch size level to satisfy future quotas. Since the medium for measuring the quota is bushels, it should be noted that there exists a four to one ratio between the number of clams per bushel at the 3 1/2 inch and 5 1/2 inch size levels. For example, in a bushel of 3 1/2 inch clams, there would be approximately 400 animals, whereas, in a bushel of 5 1/2 inch clams, there would be approximately 100 animals. Considering that a 5% mortality rate is reasonable prediction for clams growing from the 3 1/2 inch size level to the 5 1/2 inch size level, a considerable resource advantage would be gained by allowing the clam to reach maturity. Also, from a reproductivity standpoint, clams harvested at the larger size levels will have had an opportunity to experience additional reproductive cycles. Definite advantages also exist from a product standpoint regarding the 5 1/2 inch size limit in that a greater variety of products can be produced from the larger clam and the value of the 5 1/2 inch clam is approximately two to three times greater than that of the 3 1/2 inch size clam. It is also pertinent to note that a size limit had been proposed in Draft Amendment No. 2 and the primary reason for deleting such measure from the final version of the plan involved enforcement problems which have been resolved through the provisions contained in the current surf clam size proposal.

In considering the comments presented at the public hearings,
APP II 43

Mr. John C. Bryson
June 8, 1981
Page Four

there was a consensus of opinion generally supporting the recommended alternatives which have been endorsed by the Industry Advisory Subpanel. The only major exception involved comments made at the public hearing held in Wakefield, Rhode Island in which New England participants not engaged in surf clam fishing suggested radical changes to the management plan without justification. It was also recommended at such meeting that the moratorium and any form of limited entry not be included in the new plan. It must be emphasized that the New England viewpoint as represented by non-participants in the fishery is unequivocally opposed by both the surf clam fishing and processing industry located in the Mid-Atlantic area.

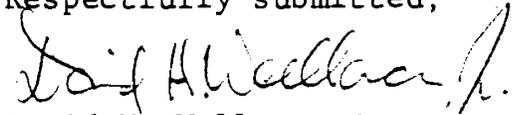
At the public hearing held in Wildwood, New Jersey there was considerable commentary regarding the surf clam size limit, however, it should be noted that at the Industry Advisory Subpanel meeting held in Dover, Delaware on May 29, 1981 it was indicated by various fishermen in the New Jersey area who had spoken against the size limit that the 5 1/2 inch size limit was considered desirable in view of the consequences resulting from non-adoption of the measure.

In addition to the foregoing, The American Original Corporation also wishes to express its support for the proposal to allow the Regional Director a considerable amount of flexibility in dealing with certain plan features such as the opening of closed areas. One of the greatest difficulties confronting the surf clam industry

Mr. John C. Bryson
June 8, 1981
Page Five

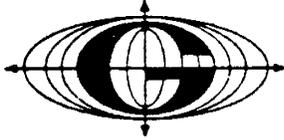
at this time involves the ability of regulatory bodies to respond to problems in a timely manner through either formal management plan amendment procedures or emergency action. Since the plan is expected to remain in existence for a considerable period of time, foresight in allowing for flexibility in critical areas is most important.

Respectfully submitted,



David H. Wallace, Jr.
Vice President
The American Original Corp.

cc: Joyce M. T. Wood, Director
Office of Ecology & Conservation



THE GORTON GROUP / GLOUCESTER, MASSACHUSETTS 01930

AREA CODE 617 283-3000

CABLE ADDRESS GORTONS

June 10, 1981

RECEIVED

Mr. John C. Bryson
Executive Director
Room 2115 Federal Bldg.
North & New Sts.
Dover, Del. 19901

JUN 13 1981

MID ATLANTIC COUNCIL

Dear John,

It is my understanding that there is consideration being given in the surf clam plan to fixing a 5 1/2 inch limit. Let me go on record that the Gorton Group opposes such a restriction.

It is our opinion that such a restriction will be very difficult to enforce, leading to conflict. We also feel this could arbitrarily raise the price. Rather we feel that the most effective way to enforce conservation is through the current plan, which has an established quota, restriction on fishing days and area closures.

Sincerely,

John E. P. Borden
Vice President, Operations

ja



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
674 AND WALNUT STREETS
PHILADELPHIA, PENNSYLVANIA 19106

JUN 8 1981

Mr. John C. Bryson
Executive Director
Mid-Atlantic Fishery
Management Council
Federal Building, Room 2115
North & New Streets
Dover, Delaware 19901

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JUN 17 1981

MID ATLANTIC COUNCIL

Re: Draft Amendments No. 3 for the Surf Clam and Ocean Quahog Fishery
Management Plan and Draft Environmental Impact Statement

Dear Mr. Bryson:

The Environmental Protection Agency's comments on the above referenced draft Environmental Impact Statement, dated April 16, 1981, have been classified as Category LO-1; specifically, we have no objections to the draft as written. The classification and the date of EPA's comments will be published in the Federal Register in accordance with our responsibility to inform the public of our views on proposed Federal actions under Section 309 of the Clean Air Act.

Definitions of the categories are provided on the attachment. Our procedure is to categorize our comments on both the environmental consequences of the proposed action and the adequacy of the impact statement at the draft stage.

Sincerely yours,


John R. Pomponio

Chief
EIS & Wetlands Review Section

Enclosure

Definition of Codes for the General Nature of EPA Comments

Environmental Impact of the Action

LO--Lack of Objections

EPA has no objections to the proposed action as described in the draft impact statement or suggests only minor changes in the proposed action.

ER--Environmental Reservations

EPA has reservations concerning the environmental effects of certain aspects of the proposed action. EPA believes that further study of suggested alternatives or modifications is required and has asked the originating Federal agency to reassess these aspects.

EU--Environmentally Unsatisfactory

EPA believes that the proposed action is unsatisfactory because of its potentially harmful effect on the environment. Furthermore, the Agency believes that the potential safeguards which might be utilized may not adequately protect the environment from hazards arising from this action. The Agency recommends that alternatives to the action be analyzed further (including the possibility of no action at all).

Adequacy of the Impact Statement

Category 1--Adequate

The draft impact statement adequately sets forth the environmental impact of the proposed project or action as well as alternatives reasonably available to the project or action.

Category 2--Insufficient information

EPA believes that the draft impact statement does not contain sufficient information to assess fully the environmental impact of the proposed project or action. However, from the information submitted, the Agency is able to make a preliminary determination of the impact on the environment. EPA has requested that the originator provide the information that was not included in the draft statement.

Category 3--Inadequate

EPA believes that the draft impact statement does not adequately assess the environmental impact of the proposed project or action, or that the statement inadequately analyzes reasonably available alternatives. The Agency has requested more information and analysis concerning the potential environmental hazards and has asked that substantial revision be made to the draft statement.

If a draft impact statement is assigned a Category 3, ordinarily no rating will be made of the project or action, since a basis does not generally exist on which to make such a determination.

REGULATORY IMPACT REVIEW

OF AMENDMENT #3 TO THE

SURF CLAM AND OCEAN QUAHOG

FISHERY MANAGEMENT PLAN

January 1981
Revised 19 March 1981
Revised 11 June 1981

Prepared by the
Mid-Atlantic Fishery Management Council
with the assistance of the
National Marine Fisheries Service

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I. Introduction

In compliance with Executive Order 12291, this Regulatory Impact Review (RIR) has been prepared for Amendment #3 to the Surf Clam and Ocean Quahog Fishery Management Plan (Plan). In this RIR, prepared by the Mid-Atlantic Fishery Management Council, with assistance from NMFS, attention is given to the impacts of new regulations and the incremental effects of revised regulations from the current Plan.

A. Management Unit

The management unit for this Plan continues unchanged and includes all surf clams (Spisula solidissima) and all ocean quahogs (Arctica islandica) in the Atlantic FCZ.

B. Statement of the Problems Addressed by the Plan

The Plan addressed a number of problems bearing on the maintenance and enhancement of the resources and the industry for surf clams and ocean quahogs. When the Plan was being prepared in 1977, surf clam stocks were declining and there was significantly greater capacity to harvest and process surf clams than could be actively employed without threatening the long term yield from the fishery. Because of this, restrictions were placed on the level of removals of surf clams and no further entrants were allowed into the surf clam harvesting sector. Quahogs, which are now extensively used as a substitute for surf clam meats in finished product production, were just beginning to be utilized. However, because biological information concerning ocean quahogs was extremely limited (see Section V of Amendment #3), the Council decided to manage the two species jointly to prevent excessive exploitation of quahogs from effort transfers from the surf clam fleet and a precautionary quota was placed on total quahog landings.

Amendment #1 extended the Plan from 30 September to 31 December 1979 and included additional reporting requirements for processors based on amendments to the MFCMA.

Amendment #2 extended the Plan through 31 December 1981 and included refinements to the management regime. The surf clam quota for the Mid-Atlantic Area was continued unchanged. A special surf clam management area was created for New England with a quota of 25,000 bushels. The moratorium on entry of vessels into the Mid-Atlantic Area was continued. The ocean quahog quota was increased to 3.5 million bushels for 1980 and 4.0 million bushels for 1981.

Amendment #3, which is the subject of this RIR, is intended to further refine the management program. In addition to changing the Plan into a framework Plan, there are two major issues that are not incremental in effect with respect to the existing Plan. These involve replacing the moratorium on entry of vessels into the Mid-Atlantic Area surf clam fishery and establishing a size limit for surf clams.

In 1977, severe adverse resource and economic conditions led to emergency implementation of the initial Plan which contained an interim moratorium on entry of additional vessels into the surf clam fishery. These adverse conditions were:

1. A rapidly declining resource due to overharvesting and the loss of productive northern New Jersey clam beds because of anoxia.
2. The existence of a fleet with the capacity to harvest the surf clam maximum sustainable yield several times over.
3. High surf clam prices induced a significant increase in harvesting capacity.
4. Much economic instability in the fishery with potentially high unemployment if the fishery completely collapsed.
5. A severe lack of good data upon which to base permanent management decisions.

It was felt that an interim emergency moratorium was needed to provide "breathing space" that would help to stabilize the long-term economic and resource aspects of the fishery and provide a greater range of resource management options in the future.

The moratorium was extended through the end of 1979 by NMFS at the request of the Council. Amendment #2 extended the moratorium through the end of 1981 in the Mid-Atlantic Area while permitting free entry in the New England Area.

While the conditions that led to the initial moratorium are less severe now, because of the high surplus capacity of the fleet it is felt that a return to a completely open fishery would cancel any of the progress that has been made toward rebuilding the stock and providing a stable economic environment. In 1974 the entire fleet consisted of 98 vessels catching approximately 96.1 million pounds of surf clams and 838,000 pounds of ocean quahogs. When the initial Plan was adopted, there were 155 vessels landing 51.8 million pounds of surf clams and 18.4 million pounds of ocean quahogs. In 1980 there were approximately 38.4 million pounds of surf clams and 33.8 million pounds of ocean quahogs landed by 123 vessels (there were 164 vessels with permits to land surf clams and ocean quahogs, 63 vessels with permits to land only ocean quahogs, and 112 vessels with New England Area surf clam permits; no surf clam landings were reported from the New England Area). It must also be noted that vessels were frequently limited to fish only 24 hours/week, based on the effort limitations in the Plan. Recently there has been a heavy substitution of small surf clams in normally ocean quahog based products and many of the vessels and processors who are still using ocean quahogs are contemplating switching to surf clams, further intensifying harvesting pressure on the surf clam resource. Since it is apparent that a tremendous amount of excess capacity exists in the fleet, there is still a significant potential for the fishery to return to a situation not unlike the one that originally prompted the moratorium.

When the moratorium was initiated, the Council recognized that it could not permanently "close the door" on new entrants and indicated its intent to assess the need for an alternative limited entry system. There is still a need for an entry limitation system for both conservation and economic reasons. A completely open fishery with a rapid influx of new entrants would increase the probability that quotas would be exceeded before NMFS could implement measures to decrease catch rates or close the fishery. An extreme increase in the number of active vessels would tax the ability of the reporting system to give managers timely information upon which to make decisions. Increased effort would increase the probability of closures which, in turn, would increase the probability of falsification of catch reports, violations of regulations, and further increases of effort in order to offset the impacts of the anticipated closures. Enforcement costs would increase because of the additional vessels.

Is free entry desirable or should access be controlled? Alternatives 1, 2, 5, 8, and 9 address this question.

Currently there is no surf clam size limit. Only the price differential between small surf clams and ocean quahogs exists as a disincentive to harvesters who otherwise, if the price were right, would take advantage of clam beds that are densely populated with small clams. In 1980 this differential was small enough that processors who normally use quahogs in their products were accepting small surf clams from harvesters at a significant rate. While these small clams can be used in various product lines, they cannot be used for breaded strips, which require large clams. The taking of small clams directly reduces the future supply of large clams. Is the taking of small clams desirable or should a size limit be imposed? Alternatives 2, 8, and 9 recommend a 5.5" surf clam size limit, while alternative 1 would not institute a size limit.

Four minor issues that are incremental in effect, relative to the current Plan, are also addressed in this Amendment. The first deals with reopening closed areas so that any potential negative impacts (biological and economic) are mitigated. Alternatives 6 and 7 address this issue. The second relates to the allocation of the quota throughout the year through quarterly quotas and effort limitations. Alternatives 2, 3, and 4 are concerned with this issue. The third minor issue is the expansion of the number of months during which the bad weather make-up day provision is in effect. The proposed two month extension would increase the opportunity of all fishermen to fish. This is addressed in alternatives 2 and 4. The fourth minor issue is the expansion of the fishing week from 4 to 4½ days. This is also addressed in alternatives 2 and 4.

C. Specific Objectives of this Amendment

The objectives have been changed from the original Plan and are:

1. Rebuild the surf clam populations to allow eventual harvest approaching the 50 million pound level, which is the estimate of maximum sustainable yield over the range of the resource, based on the

average yearly catch from 1960 to 1976.

2. Minimize economic dislocation to the extent possible consistent with objective 1 and encourage efficiency in the fishery.
3. Prevent the harvest of ocean quahogs from exceeding maximum sustainable yield and direct the fishery toward achieving Optimum Yield.
4. Provide the greatest degrees of freedom and flexibility to all harvesters of these resources consistent with the attainment of the other objectives of this Plan.
5. Optimize yield per recruit.
6. Increase understanding of the conditions of the stocks and fishery.

The reasons for changing the objectives are discussed in Section IV of the Amendment.

D. Alternative Measures Considered

The alternative measures considered are set forth in Section XII-2 and evaluated in Section XII-3 of the Amendment. In summary they are:

1. Take no action at this time (allow the Plan to lapse).
2. Continue the provision to close areas with large numbers of small surf clams, impose a 5.5" surf clam size limit in both the Mid-Atlantic and New England Areas, continue annual and quarterly quotas, and continue the effort restrictions in the current Plan. The ocean quahog regime would be continued unchanged.
3. Remove effort restrictions.
4. Revise the fishing week, bad weather make-up day, and effort restrictions.
5. Institute a permit limitation system in the surf clam fishery.
6. Create two Mid-Atlantic surf clam management areas.
7. Create separate management areas for reopened surf clam areas.
8. Continue the provision to close areas with small surf clams, impose a 5.5" surf clam size limit, continue annual quotas, and institute a vessel allocation system in the surf clam fishery.
9. Continue the provision to close areas with large numbers of small surf clams and impose a 5.5" surf clam size limit. The ocean quahog regime would continue unchanged.

The recommended alternative is a combination of alternatives 2, 4, 5, and 7.

E. The Measures Recommended in this Amendment

The management measures recommended, for public hearing purposes, in the Amendment are discussed in Section XII-4. Following the review process, the Council adopted the following measures for Amendment #3:

1. Annual surf clam quotas of between 1.8 and 2.9 million bushels in the Mid-Atlantic Area and 25,000 and 100,000 bushels in the New England Area, with annual quotas set administratively rather than by Plan Amendment.

In the Mid-Atlantic Area, the quota is allocated by quarter and fishing effort is regulated by restricting days and hours fished. The quarterly quotas are equal for each quarter. If a quarterly quota is exceeded under the time allotment, the Regional Director of NMFS may prohibit fishing. The

fishing week is from 6:00 am Sunday to 6:00 pm Thursday; unless fishing is permitted for 18 or 36 hours per week (or another time period evenly divisible by 18), in which case the Regional Director, in consultation with the Council, may begin the fishing week at 12:00 am Sunday. Fishing time may be restricted by the Regional Director to insure that the quarterly quota is not exceeded. A bad weather make-up day is permitted on the fishing day following the fishing day during which the bad weather condition existed during November through April. Vessels would start and stop fishing at uniform hours. All surf clam fishing periods end at 6:00 pm.

2. All aspects of ocean quahog management remain unchanged except that the quota would be between 4.0 and 6.0 million bushels, with annual quotas set administratively, rather than by Plan Amendment.
3. The prohibition on the entry of additional vessels into the surf clam fishery in the Mid-Atlantic Area would be replaced by a system of limiting the number of permits that could be issued to harvest surf clams from the Mid-Atlantic Area. All vessels that were eligible for permits pursuant to the moratorium at the beginning of 1982 would receive permits under the new system for 1982. In order to maintain surf clam permit eligibility in the future, vessels would need to harvest annually a minimum of 2,500 bushels of surf clams and/or ocean quahogs from the Mid-Atlantic Area. During the first 5 years that the Amendment is in effect (1982-1986), new entrants would be permitted on a ratio of 1 new permit issued for every 4 permits not reissued. After 1986, 1 new permit could be issued for every permit not reissued.
4. The provision to close surf clam beds to fishing wherein over 60% of the clams are under 4.5" in length and less than 15% are over 5.5" in length would be continued. Provision is made for reopening of such areas (or portions thereof). Reopened areas would be treated as special management areas with separate allowable catches and effort limitations until the catch per unit of effort in the reopened area was similar to that in the fishery generally.
5. A 5.5 inch surf clam minimum size limit is imposed in the Mid-Atlantic Area.
6. The licensing and reporting requirements are continued. Vessels would have to meet the above eligibility criterion to maintain surf clam permits in the Mid-Atlantic Area, but not in the New England Area, and must submit fishing reports on a weekly basis.
7. The New England Area, defined as that portion of the fishery conducted northeastward of the dividing line between the New England and Mid-Atlantic Fishery Management Councils, would continue to be managed separately. The quota would be between 25,000 and 100,000 bushels. Vessels entering the fishery which do not qualify under the permit system would not be allowed to fish outside of New England, and would have to cease fishing entirely when the quota had been taken. There would be no restriction on fishing effort until half of the quota had been taken, at which time effort restrictions could be imposed.

II. ECONOMIC IMPACT ANALYSIS

A. Structure for Estimating Economic Impacts

The objective of this analysis is to quantify the impact of the adopted measures and their alternatives. Various economic performance indicators have been selected to measure these impacts. These indicators, as described in Section IX of the Amendment and forecasted in this RIR, are total US catches by species, ex-vessel prices by species, total gross revenues by species to harvesting sector, total gross revenues from all species to harvesting sector, distribution of total species revenues among the various vessel classes, and crew shares by vessel class. Ideally the impacts of costs by vessel class, net profits by vessel class, wholesale revenues, finished product production, total revenues to processing sector, and changes in employment in processing sector should also be forecasted. Unfortunately, adequate models or data with which to forecast these latter indicators are unavailable (attempts are being made to develop them). However, it can be argued that the likely impacts on the processing sector of many of the alternatives will be minimal.

Impacts will be analyzed in the following fashion. First, the various performance indicators will be forecasted assuming the existing Plan will remain in place. This means that the forecasts are based on the moratorium remaining and no size limit being in effect. The impacts of each alternative measure will

then be evaluated in reference to these initial forecasts. That is, forecasts will be made to indicate how each measure incrementally impacts the fishery relative to the existing Plan. While this Amendment is for the 1982 fishery, for impact tracking purposes, the impacts of the alternatives were also forecasted as if they were placed on the 1981 fishery as well. This was primarily done because these impacts are based on forecasts concerning the general health of the economy and near term forecasts are more reliable than forecasts predicting macro-economic events three years from now.

B. Estimated Economic Impacts

1. Impacts of Maintaining the Existing Plan

1980 FCZ Surf Clam and Ocean Quahog Fishery Performance

The following discussion is based on 1980 surf clam and ocean quahog vessel and processor logbooks received by NMFS by 23 January 1981. The information and analysis are preliminary and provisional. For a discussion of trends and a more complete description of the fishery, see Section IX of the Amendment.

The fishery offered mixed performance in 1980. Surf clam landings were up from a 1979 slump below the allowable catch. For the year, 1,905,000 bushels were harvested, exceeding the adjusted annual quota of 1,860,000 bushels by about 2%. The ocean quahog fishery was off from the pace developed over the last several years, registering a decline in landings from the 1979 high of 3,162,900 bushels to 2,945,600 bushels, or a 7% drop. The landings projected for 1980 before the year began, were 3,300,000 bushels, which indicate the fishery fell short of expectations by a considerable amount.

Much of the surf clam harvest was taken late in the year, at a time when large beds of small clams were coming to commercially usable size. The exceptional abundance of clams in these beds, and the considerable fishing effort directed in those areas, resulted in very high harvests through the latter part of the year.

1980 began with slack business prospects and high interest rates. At least part of the decline in ocean quahog production can be attributed to processor unwillingness to inventory product early in the year because of high costs. When conditions began to improve, production of smaller surf clams at lower than usual vessel prices probably provided ocean quahogs with their first real competition. With surf clams selling for \$5 to \$7 a bushel, and as low as \$3.30 at times, the greater yield of meat per bushel actually made surf clams cheaper than ocean quahogs.

An important change for many surf clam fishermen was the incorporation of a bad weather make-up period. For the first time, fishermen who could not fish during their scheduled limited fishing hours could make up a trip that was lost due to severe weather or sea conditions. The make-up period was allowed during December through March. Accompanying the make-up period was a redistribution of the quarterly quotas. The January-March and October-December quotas were increased from 350,000 to 400,000 bushels. The April-June and July-September quotas were reduced from 550,000 to 500,000 bushels. The changes reflect fishing experience in 1978 and 1979, and provided more clams in the months with the make-up provision.

1980 Vessel Activity in the FCZ

Only complete logbook records containing landings and fishing time were used in this analysis. Actual total harvest, number of trips, and catch per vessel may, therefore, be slightly understated.

1980 Performance by Vessel Class, Surf Clams (includes any vessel landing at least 1 bu. of surf clams in 1980)

Class*	No. of Vessels	Total Catch	Catch/Vessel	Relative Catch Rates
1	13	60,502 bu.	4,654 bu.	1.00
2	49	478,044	9,756	2.10
3	61	1,288,015	21,115	4.54
Total	123	1,826,561	14,850	

* Classes are 1 = 0-50 GRT, 2 = 51-100 GRT, 3 = 101+ GRT.

The difference in relative catch rates occurs because of differences in productivity per hour fished, and differences in total number of hours fished, by vessel class. The primary reason for the greater relative harvest rates by the larger vessels is the greater amount of time those vessels fished.

<u>Class</u>	<u>Catch/Hour</u>	<u>Catch Ratio</u>	<u>Hours/Vessel</u>	<u>Time Ratio</u>	<u>Combined Effect</u>
1	19.61 bu.	1.00	237 hours	1.00	1.00
2	23.78	1.21	410	1.73	2.09
3	37.99	1.94	556	2.34	4.54

Larger vessels both catch more clams per hour fishing and spend more hours fishing per year than their smaller counterparts. To put the difference in vessel performance by class into better perspective, in 1978 the relative fishing powers, or catch rates of vessel classes were:

<u>Class</u>	<u>1978 Relative Rates</u>	<u>1979 Relative Rates</u>
1	1.00	1.00
2	1.84	2.10
3	3.36	4.54

It is apparent that the largest class of vessel has improved its performance relative to the smaller classes. Since the active fleet has declined from 152 vessels in 1978 to 123 vessels in 1980, the improvement did not reduce the other vessel class absolute shares. Larger vessels have taken up the slack left by those vessels which no longer operate in the fishery.

The surf clam fishery is managed primarily through restrictions of fishing time. In 1980, the allowable level of fishing time was high for much of the year. The slow economy during the first part of the year reduced demand for many products and increased the cost of carrying inventory. This reduced the demand for surf clams at the vessel level, allowing an increase in fishing time which gave operators more operating flexibility. Fishing time allowed during the year was as follows:

<u>Period</u>	<u>Allowable Hours per Week</u>
January 1	24
February 18	36
March 31	24
April 20	36
May 18	48
June 29	24
July 7	48
September 28	24

A total of 25 weeks at 24 hours per week, 10 weeks at 36 hours per week, and 18 weeks at 48 hours per week gave fishermen 1,824 potential fishing hours, or an average of 34 hours per week over the 53 weeks. Referring back to the average hours fished by vessel class, the utilization of fishing time available by class was:

<u>Class</u>	<u>Hours/Vessel</u>	<u>% of Allowable Hours Used</u>
1	237	13%
2	410	22%
3	556	30%

It appears that the fishing time restrictions did not, on the average, constrain vessel activity during the year. While individual vessels may have fished more than the average and close to the total allowable time, most came nowhere close.

1980 Performance by Vessel Class, Ocean Quahogs
(includes any vessel landing at least 1 bu. of ocean quahogs in 1980)

<u>Class*</u>	<u>No. of Vessels</u>	<u>Total Catch</u>	<u>Catch/Vessel</u>	<u>Relative Catch Rates</u>
1	3	7,419 bu.	2,473 bu.	1.00
2	10	114,020	11,402	4.61
3	31	2,268,363	73,173	29.59
Total	44	2,389,802	54,314	

The difference in relative catch rates occurs because of differences in productivity per hour fished, and differences in total number of hours fished, by vessel class.

<u>Class</u>	<u>Catch/Hour</u>	<u>Catch Ratio</u>	<u>Hours/Vessel</u>	<u>Time Ratio</u>	<u>Combined Effect</u>
1	124.76 bu.	1.00	20 hours	1.00	1.00
2	110.70	.88	103	5.24	4.61
3	116.72	.93	627	31.87	29.59

The larger vessels have considerably more time devoted to quahog harvest than their smaller counterparts. Smaller vessels generally lack the carrying capacity to make a worthwhile trip with lower value quahogs. They are unable to fish farther offshore and at the greater depths where quahogs are found. Few smaller vessels have the close relationships to processors generally held by the ocean quahog vessel operators, and so market access may be limited. To put the differences by class into perspective, in 1978, the relative fishing powers, or catch rates of vessel classes, were as follows:

<u>Class</u>	<u>1978 Relative Rates</u>	<u>1980 Relative Rates</u>
1	1.00	1.00
2	13.18	4.61
3	36.35	29.59

The relative performance of the middle class has declined. While both large and small vessels substantially increased their average harvests, the medium vessels experienced a net decline. The total number of active quahog vessels declined from 51 in 1978 to 44 in 1980.

New England Fishery

From the implementation of the original Plan, the New England fishery has operated apart from and at a much different scale from the Mid-Atlantic fishery. The difference was officially recognized in 1980, when Amendment #2 created a separate New England management area for the surf clam fishery. Since 1 January 1980, 112 vessels have applied for and received permits allowing them to fish for surf clams in New England waters. None of them has reported surf clam or ocean quahog landings. All reported landings of New England based vessels in 1980 amounted to something less than 5,000 bushels of surf clams, and less than 100,000 bushels of ocean quahogs. Because of smaller numbers of active participants, more precise figures cannot be provided.

1980 Performance by Vessel Class, Surf Clams and Ocean Quahogs
(includes any vessel landing at least 1 bu. of both surf clams and ocean quahogs in 1980)

<u>Class</u>	<u>No. of vessels</u>	<u>Surf Clam Catch/Vessel</u>	<u>Relative Surf Clam Catch Rate</u>	<u>Ocean Quahog Catch/Vessel</u>	<u>Relative Ocean Quahog Catch Rate</u>
1	3	4,861 bu.	1.00	2,473 bu.	1.00
2	10	13,221	2.72	11,402	4.61
3	31	14,581	2.99	73,173	29.59
Total	44	13,609		54,314	

Each of the vessels active in the ocean quahog fishery also took at least some surf clams in 1980. Only in the largest vessel class do the vessels take a predominant portion of their landings in the ocean quahog fishery.

Vessel License and Activity Summary

As of 31 December 1980, there were 164 surf clam/ocean quahog, 63 ocean quahog only, and 112 New England surf clam licenses outstanding. The vessel landing records reflect that 79 vessels landed only surf clams, no vessels landed only ocean quahogs, 44 vessels landed both surf clams and ocean quahogs, and 216 vessels landed neither surf clams nor ocean quahogs.

Forecasts of Maintaining the Existing Plan

In 1980, there was a major structural change in the fishery. For a time, small surf clams were used as substitutes for quahogs. This phenomenon has made forecasting of future levels of catch by species difficult. Without a size limit, it would be expected that the current rate of substitution of small clams would at least be maintained and, probably, increased. This would mean that the entire surf clam quota would be harvested, quahog harvests would fall below current levels, and the average ex-vessel price of surf clams would decline (since the average annual catch would be composed increasingly of lower valued clams relative to pre-1980 harvests). The forecast of maintaining the existing Plan without a size limit assumes that this rate of substitution will exist, and that quahog prices will remain constant for the years 1981-1982, since over the past 5 years quahog prices have not changed nominally. (Appendix A describes the model used to forecast the inflation adjusted (real) prices of surf clams.) The 1981 and 1982 forecasts of current (nominal) surf clam revenues and prices are probably biased upward because they are based on the assumption that ex-vessel prices will keep pace with predicted rates of inflation of 10.2% and 9.5% for the years 1981 and 1982, respectively. Forecasts of average real surf clam prices and real revenues may be biased downward for several reasons. First, the forecast assumes that small clams for 1981 and 1982 will be taken at the same rate as in 1980. Many of these clams were taken from areas now closed to fishing. Unless there are other areas dominated by the abundance of small clams, actual average real surf clam prices will increase relative to the forecasted values as large clams increase as a percentage of total catch. Secondly, the taking of small clams reduces the available quota remaining for large clams, causing a short-run shortage of large clams. This shortage would drive up the average price of large surf clams and, thus, tend to drive up the average price of all surf clams. If this shortage increases relative to 1980, then the average real prices and revenues for all surf clams will be higher than their 1981-1982 forecasted values. The third reason why the real price and revenue forecasts may be biased downward is that the taking of small clams reduces directly the availability of large clams at some future time, causing prices of large clams to increase. This would cause an increase in the long run average price of surf clams relative to their forecasted levels.

The forecasted inflation adjusted values shown below indicate that only quahog revenues, prices, and total revenues show any significant trends (downward).

Total Industry Landings, Revenues, Prices and Actual and Forecasted Values of Maintaining the Existing Plan

	Surf Clam			Ocean Quahog			Total Revenues
	Landings (1000 lbs.)	Revenues (\$1,000)	Price \$/lb.	Landings (1000 lbs.)	Revenues (\$1,000)	Price \$/lb.	
1980	37,825	19,089	.504	33,742	10,155	.301	29,244
1981	37,825	21,182	.560	33,742	10,123	.300	31,305
1982	37,825	23,456	.620	33,742	10,123	.300	33,579

Inflation Adjusted Values (1967 \$)

1980	7,107	.188	3,781	.112	10,888
1981	7,183	.190	3,374	.101	10,557
1982	7,251	.192	3,037	.093	10,288

Distribution of Total Industry Revenues 1980 (1000\$)

FCZ Surf Clam Revenue	15,861	54%
Inshore Surf Clam Revenue	3,228	11%
Quahog Revenue	10,155	45%
Total	29,244	100%

This table is based on the following assumptions. Since inshore landings and prices for 1980 were unavailable, the difference between total state landings (3.78×10^7 lbs.) and reported FCZ landings (3.15×10^7 lbs.) was used as a proxy for inshore landings (0.63×10^7 lbs.). Separate prices for inshore and FCZ clams were unavailable, so they were assumed to have the same average price. Therefore, inshore revenues were determined to be the difference between total surf clam revenues and estimated FCZ surf clam revenues. It is also assumed that the percentage distribution of revenues by species will remain constant for 1981-1982.

Level and Percentage Distribution of Revenues by Vessel Class 1980

Class	Quahog		Inshore Clams		FCZ Clams		Total	
	%	\$1000	%	\$1000	%	\$1000	%	\$1000
1	.3	30	28.0	904	3.8	603	5.3	1537
2	4.8	487	54.0	1743	24.4	3870	20.9	6101
3	94.9	9637	18.0	581	71.8	11388	73.8	21606

The quahog, FCZ clam, and inshore clam revenues by vessel class reported in this table were developed in the following manner. First, forecasts of total industry revenues (nominal) for quahogs and surf clams were estimated for 1980. Then the forecast of surf clam revenues was split into estimates of inshore revenues and FCZ revenues. Quahog revenues and FCZ revenues were then assigned to vessel classes according to 1980 average percentage vessel class catches of quahogs and FCZ surf clams (FCZ surf clam and ocean quahog vessel class percentages based on logbook records containing landings information, but not necessarily containing fishing time information). Finally, inshore revenues were distributed according to the 1979 distribution of inshore revenues by vessel class, since 1980 inshore data by vessel class are unavailable. It is assumed for 1981 and 1982 that the percentage distribution of revenues by vessel class will remain constant, even though there seem to be the following general trends in the fishery: the share of total inshore revenues by Class 1 vessels has been increasing, while for FCZ species revenues the Class 2 and 3 vessel shares have been declining and increasing, respectively.

While a complete cost model of the fleet is unavailable, it is understood that crew shares average about 1/3 of gross revenues. Further, it is assumed that the average number of crew members per vessel for classes 1, 2, and 3 are 3, 4, and 5, respectively. The 1981 and 1982 forecasts maintain these assumptions with the additional assumption that the number of vessels in each class remains constant.

Actual and Forecasted Average Vessel Earnings and Crew Shares, 1980-1982 (\$1000)

	Class 1			Class 2			Class 3		
	1980	1981	1982	1980	1981	1982	1980	1981	1982
Number of vessels	13			49			61		
Crew Size	3			4			5		
Vessel Class Revenue	1537.0	1659.0	1780.0	6106.0	6542.0	7017.0	21606.0	23270.0	24784.0
Ave. Gross Revenue	118.2	127.6	136.9	125.0	133.5	143.2	354.2	378.2	406.3
Total Crew Share	35.5	38.3	41.1	37.4	40.1	43.0	106.3	113.5	121.9
Ave. Crew Share	11.8	12.8	13.7	9.3	10.0	10.7	21.3	22.7	24.4

Adjusted for Inflation (1967 \$)

Vessel Class Revenue	573.0	559.0	549.0	2283.0	2210.0	2166.0	8064.0	7796.0	7643.0
Ave. Gross Revenue	44.1	43.1	42.2	46.6	45.1	44.2	132.2	127.8	125.3
Total Crew Share	13.2	12.9	12.7	14.0	13.5	13.3	39.7	38.3	37.3
Ave. crew share	4.4	4.3	4.2	3.5	3.4	3.3	7.0	7.7	7.5

2. Replacing the moratorium.

Since the moratorium was considered an interim measure, the question arises whether entry into the fishery should be controlled. Alternatives 1, 2, and 9 include no controls on entry. Alternatives 5a and 5b present various methods for limiting entry to the Mid-Atlantic Area surf clam fishery. Alternative 8 would limit entry and would also establish a vessel allocation system.

Before these alternatives are analyzed, a preliminary issue must be addressed. Economic theory suggests that new entrants will be attracted to the industry by the existence of potential profits. Appendix B presents some very preliminary estimates of vessel income and expense profiles. These 1979 estimates indicate that, on average, Class 2 and 3 vessels operating in the FCZ are making profits with annual net incomes of \$2,000 and \$8,000, respectively. The average Class 1 vessel is unprofitable with a net income of \$-14,000. For all classes, gross revenues are higher than variable costs.

However, these results must be strongly qualified. The cost estimates need updating as certain costs (i.e., fuel) have increased while, in real terms, the average prices of surf clams and ocean quahogs have fallen. Finally, many of the vessels are new and have heavy mortgage payments because of currently high interest rates. These vessels must be identified in order to get better income and expense profiles. This last qualification relates to the new entrant problem in another way. While profits seem to exist in the fishery, it is unknown whether the rate of return on these profits is sufficient to attract new investment.

To the extent that there may be incentives for new entrants to the fishery, the revenue effects of a new entrant would be similar to those predicted in the previous RA. If a new entrant enters the fishery, average gross revenues to the remaining fleet would fall because of the existence of excess capacity. If a new entrant is either a Class 1, Class 2, or Class 3 vessel, average vessel gross revenues for the entire fleet would fall either 0.31%, 0.44%, or 1.0%, respectively. In terms of average vessel class revenues (see Table 18 in the Amendment), a minimum reduction of \$189, \$294, and \$850 to Class 1, Class 2, and Class 3 vessels would occur if a Class 1 vessel enters. Similarly, estimates of the reductions to the existing fleet if a Class 3 vessel enters the fishery are \$610, \$948, and \$2,742 for the same vessel classes. Furthermore, the existing fleet has frequently been operating at 24 hours per week because of the quotas and effort limitations. It seems for economic efficiency reasons, that prior to allowing new entrants, the conditions of the fishery must be improved so that vessels can operate for longer periods. This would allow existing vessels to make better use of existing capital. Therefore, some entry limitation alternative should be adopted.

Alternative 1, free entry without quotas, was analyzed in the original Plan. The reasons that it was found unacceptable then, and continues to be now, were detailed in that document and are relevant here. This approach would lead to biological overexploitation, further overcapitalization, reduced earnings in the harvesting sector, and higher consumer prices. The only difference between alternatives 1 and 9, with regard to the surf clam fishery, is the use of area closures and the imposition of a 5.5" surf clam size limit. While alternative 9 may mitigate some of the biological impacts of alternative 1, its economic impacts would be similar. Therefore, alternatives 1 and 9 are unacceptable for the same reasons.

The economic impacts of alternative 8, the vessel allocation scheme, cannot be estimated until 1980 data are made available, for it requires 1980 logbook data as part of its allocation system. Its short run and long run impacts are discussed qualitatively in Section XII-3 of the Amendment.

Both alternatives 5a and 5b control entry by limiting the number of permits. Alternative 5a allows a new entrant either by purchase of an existing vessel with its permit or by the issuance of a new permit for a permit not reissued because the initial vessel did not meet the minimum annual landing requirement of 2,500 bushels of FCZ surf clams or ocean quahogs. During the first five years the Amendment is in effect, 1 new permit could be issued for every 4 not reissued. After that, the ratio would be 1 for 1. (If a 1 for 1 rule was used for the first five years, fishing capacity would probably increase greatly since it is likely that the entering vessel would fish more actively than the vessel that it replaced.) Alternative 5b allows a new entrant either by purchase of an existing vessel with its permit or by the issuance of a new permit for a permit not reissued because the initial vessel did not meet the minimum annual landing requirement of 8,000 bushels of FCZ surf clams or ocean quahogs. In addition, this alternative provides that the total number of permits issuable are increased or decreased by 5 for every 5% increase or decrease in the Optimum Yield, respectively. However, no vessel that met the minimum landing criterion could lose its permit through a reduction.

A vessel limitation program coupled with minimum landing requirements for permit retention can affect fleet size and composition. If a limitation program provides for entry to and exit from the fishery which would be prevented by continuation of a moratorium, it offers important and necessary flexibility. If in the process it forces marginal operators to drop out to provide the room for new entry, adverse consequences must be carefully assessed.

Fleet Size

Adopted alternative 5a would allow issuance of 1 permit for every 4 permits retired. Of the total 164 licensed surf clam vessels, 123 actually landed surf clams or ocean quahogs in 1980. 122 vessels would have had licenses in 1980 if they had been required to take at least 2,500 bushels of surf clams or ocean quahogs in 1979 to retain the license. With a landing requirement of 8,000 bushels, the number of existing licensed vessels that met the 5b criterion dropped to 96. Attrition would have been mitigated by the availability of new permits at the rate of 1 for every 4 retired. With the 2,500 bushel landing requirement, one-fourth of 42, or 10 new permits would have been available, giving a potential fleet size of 132 vessels, or more than actually fished the following year. With the 8,000 bushel landing requirement, 68 new permits would have been available, giving a potential fleet size of 124 vessels, since alternative 5b allows for the reissuing of expired licenses on a 1 for 1 basis.

Actual attrition could be greater or less than the discussion suggests. Any vessel operator seriously intending to stay in the fishery should easily be able to schedule harvest of 2,500 bushels during a year. Unless a vessel had other sources of revenue, it is extremely unlikely that it could operate as a going concern with annual landings of less than 2,500 bushels. Under alternative 5b, attrition of existing vessels would be a function of the number of permit holders who lose permits, reapply, and receive permits as new entrants.

Fleet Composition

Removal of inactive and marginally active operators could have an effect of fleet composition and on the share of the resource taken by different fleet sectors. National Standard 4 requires that management measures not discriminate among harvesters or groups of harvesters, such as fleet sectors. Fleet sectors can be defined on the basis of ownership, vessel size, or other characteristics. Differential effects were examined by determining whether a vessel actually fished in 1980, and whether it would have fished if it had been required to meet a 2,500 bushel or 8,000 bushel landing requirement in 1979. The following table shows actual fleet composition in 1980 and projected composition with the 2,500 and 8,000 bushel landing requirements.

**Percentage of Total Fleet Composition by Tonnage Class and Type of Ownership
with License Limitation Criteria**

Class	Ownership*	% of Landings by Landing Criteria (bu./yr.)		
		None	2,500	8,000
1	T	10%	10%	5%
	S	6	4	2
	M	2	3	2
	VI	2	3	1
2	T	36	33	28
	S	16	13	9
	M	17	16	16
	VI	3	4	3
3	T	54	57	67
	S	8	9	9
	M	23	23	27
	VI	23	25	31
Totals	T	100	100	100
	S	30	26	20
	M	42	42	45
	VI	28	32	35
Actual Number of Vessels		124	122	96

* T = Total for the entire class; S = One vessel, operator not vertically integrated; M = Multiple vessels, operator not vertically integrated; VI = Operator vertically integrated.

In 1980 there were 13 Class 1 vessels, 49 Class 2 vessels, and 61 Class 3 vessels that caught at least 1 bushel of surf clams or ocean quahogs. In 1978 these values were 21, 56, and 76, respectively, indicating that there has been a downward trend in all of these classes. The impacts of the 2,500 and 8,000 bushel criteria must be viewed with this trend in mind.

Size Composition

With a 2,500 bushel landing requirement, size composition of the fleet is only slightly affected. The largest class increases 3%, while the medium class shrinks 3%. With an 8,000 bushel landing requirement, the small and medium classes shrink 5% and 8%, respectively, while the largest class increases 13%.

These numbers show that under the 2,500 bushel requirement, essentially no licenses will be given up by those currently active, while under the 8,000 bushel requirement there would be vessels from all classes that would not meet the criterion, with Class 1 and 2 vessels surrendering most licenses. However, depending on the licensing criterion, these vessels would probably reapply and if the pool of new applicants were small, it can be argued that the 8,000 bushel criterion would not seriously impact the vessel class fleet composition.

Ownership Composition

Ownership of the fleet was determined through examination of license files. Vessels were categorized as "single vessel owner not vertically integrated" if the owner owns only one vessel and has no processing interests. "Multiple vessel owner not vertically integrated" operators own more than one vessel but have no processing interests. "Vertically integrated" operators are processors that also own vessels, regardless of the number of vessels owned. These groupings represent major classes of operators which share among groups similar operating conditions and strategies. Interlocking ownerships, where, for example, a processor's accountant owns a vessel, are classified according to the owner of record, although such operators may enjoy advantages otherwise accorded only to vertically integrated operations.

With a 2,500 bushel landing requirement, the share of the vertically integrated operators would increase 4%, while single vessel operators' share would shrink 4%. With an 8,000 bushel landing requirement, single vessel operators would shrink 10% with multiple vessel operators increasing 3% and vertically integrated operators increasing 7%. It is more likely that single vessel operators will lose their licenses than the other categories.

With respect to the impacts on the degree of vertical integration, non-integrated vessels are more likely to have to reapply for new licenses under the 8,000 bushel criterion. The degree of increased vertical integration that would occur depends on the characteristics of new vessels that enter the fishery along with those vessels that reapply for permits. With the 8,000 bushel criterion, the decline in non-vertically integrated vessels is only 7%.

Harvest Shares

Changes in fleet size and composition are reflected in changes in the share of the harvest taken by different fleet sectors. The following table shows the proportion of annual and quarterly surf clam harvest taken by vessel class under actual conditions in 1980, compared with the proportions which would have prevailed if the 2,500 and 8,000 bushel landing requirements had eliminated some operators. There is little change in shares with the 2,500 bushel landing requirement. The 8,000 bushel landing requirement leads to considerable erosions of the shares of both small and medium classes, to the benefit of the larger class. These erosions, of course, would also depend on the size distribution of vessels that enter the fishery. If all new license holders are existing harvesters, then there would be no erosion of vessel class shares. However, if the attrition program replaces marginal operators with active vessels, the average fleet revenue for active operators would decline. Alternative 5a addresses this issue somewhat by allowing 1 entrant for every 4 departures. Under alternative 5b, with 1 for 1 replacement, it is impossible to forecast the impacts on average fleet revenue for active operators without knowing the capacity of the entering and exiting vessels.

**Percentage of Total Annual Surf Clam Harvest by Tonnage Class and Quarterly Period
with License Limitation Criteria**

<u>Class</u>	<u>Quarter*</u>	<u>Actual</u>	<u>2,500 bu./yr.</u>	<u>8,000 bu./yr.</u>
1		<u>3.8%</u>	<u>3.7%</u>	<u>3.0%</u>
	1	3.8	3.9	3.3
	2	4.9	4.8	3.5
	3	3.0	2.9	2.0
	4	3.4	3.4	3.0
2		<u>24.4</u>	<u>24.0</u>	<u>20.0</u>
	1	25.8	25.1	20.7
	2	25.5	24.8	20.9
	3	26.3	25.9	21.3
	4	19.5	19.6	16.4
3		<u>71.8</u>	<u>72.3</u>	<u>77.0</u>
	1	70.4	71.0	76.0
	2	69.6	70.4	75.6
	3	70.7	71.2	76.7
	4	77.1	77.0	80.3

* Quota periods: 1 = Jan. - Mar., 2 = April - June, 3 = July - Sept., 4 = Oct. - Dec.

Effects on Competition

The immediate effects on the level of competition under either licensing system are minimal. Under the 2,500 bushel criterion, all existing license holders would probably maintain their licenses. Under the 8,000 bushel criterion, the number of vessels operating in the fishery would be expected to remain equal to the current level because each revoked license could be replaced. The table above assumes that vessels which did not qualify are removed and not replaced. It is not predictive of what would occur with replacement.

The long run effects on competition under either system are also seen to be minimal. Under both systems, licenses would be reissued on a one-for-one basis after 1986. Under both systems a potential new entrant who could not obtain a license through reissuance of revoked licenses could still purchase an existing licensed vessel.

Without a moratorium or some licensing system, there is no control over the number of vessels harvesting the resource. A licensing system will at least prevent a rapid influx of new capacity should the economics of the fishery improve and thus mitigate some of the traditional problems of an overcapitalized fishery.

Since the licensing criteria under either system are not significantly restrictive on the existing fleet, it is assumed that the impacts on revenues, and their vessel and species distributions, relative to the existing Plan, are negligible.

3. Establishing a Minimum Landing Size for Surf Clams

Alternatives 2, 8, and 9 recommend a 5.5" size limit, while alternative 1 does not include the size limit.

Absent a size limit, small clams will be heavily exploited. Two possible disincentives to their harvest can be identified. First, vertically integrated firms seeking large clams could prevent their vessels from taking small clams. However, these operators might then find themselves at a disadvantage to those taking small clams at a rapid rate threatening to close the fishery by taking the quota. Secondly, a price differential favoring large clams could encourage their harvest. However, since half of the product from the large clams is not usable in high value products, a large differential is difficult to achieve and the differential would need to be large since small clams, because of high densities, can generally be taken at lower cost.

The 5.5" size limit for surf clams is proposed to optimize the yield from the resource. All sizes of clams can be used for chowders, juices, and related product lines. However, larger clams (5.5" and larger) are

needed to produce strips, which are not only the fastest growing product line (see Table 30 in the Amendment), but on a unit basis, the highest valued product. Using figures derived from NMFS Current Fisheries Statistics No. 7803, Processed Fishery Products, Annual Summary 1978, the average wholesale price of breaded strips was \$1.78 per pound while chowder converts to an average price of \$0.58 per pound, assuming that there are 30 pounds of meat to a case of chowder. Strips and chowder are the two largest surf clam/ocean quahog product lines (see Tables 27-29 of the Amendment). This size limit will only have a negative economic efficiency impact if processing costs to the non-strip processors increase relative to any decrease in processing costs of the strip processors. This is unlikely because non-strip processors can use 5.5" clams, and approximately $\frac{1}{2}$ of the meat weight of clams used for strips is used for other clam products. In addition, ocean quahogs, in many cases, are substitutable for surf clams for products that do not use strips. Representatives from all sectors of the industry have shown support for the 5.5" size limit.

The latest stock assessment estimates that maximum yield per recruit size is 4.5"-4.75". Shell length frequency distributions of commercial surf clam landings made prior to 1980 indicate that very few clams were landed below this size. The mean size of commercially harvested clams ranged from 6.1" - 6.8" with a modal size of 6.5". However, in 1980, small clams were used heavily as substitutes for quahogs for the first time since the development of the quahog fishery. Many of these small clams were taken from candidate areas for closure. Relative to past years, the length frequency distribution of surf clam landings should show a marked increase in the percentage of small clams taken under 4.5".

The recommended size limit is 5.5", but a tolerance is provided in the proposed regulations. The regulations state that the operator can reserve 10% of his cages from inspection (a cage is a standard container holding approximately 32 bushels of clams). A violation occurs when there are more than 240 clams under 5.5" in one of the remaining cages. Therefore, some of the catch (at least 10%) may be under 5.5". The most likely effect of the regulation is to push the shell length frequency distribution of commercial landings toward larger sizes.

An added benefit of adopting the size limit is that the costs of enforcing closed area regulations will be reduced. Currently, a violator must be apprehended fishing in the closed area. A size limit would reduce the need for offshore enforcement to a significant degree, since illegal clams could be detected onshore.

The main distributional impacts of the size limit would be positive for those vessels (generally smaller and independently owned) that primarily harvest surf clams for the strip market. These vessels generally have no access to the small clam or ocean quahog markets, which are met by the larger vessels controlled by vertically integrated operators (which can also compete with the smaller vessels in the strip market). The size limit, therefore, would preserve the distribution of catches between the harvesting groups that existed prior to the harvesting of large numbers of small clams.

In order to forecast the price and revenue effects of imposing a size limit, the impacts of the substitution of small surf clams for ocean quahogs in 1980 were controlled for indirectly within the surf clam price model. The impacts of small clam landings could not be controlled for directly because neither catch nor price is recorded by surf clam size. Furthermore, quahog landings forecasts were made assuming that, if a size limit were in place, the taking of small clams would have been minimized and quahog landings would have increased relative to their 1979 levels. Quahog landings were forecasted to be 43,460,000 pounds in 1980. It was also felt that the rapid growth of the quahog fishery would probably have declined for the years 1981-1982 and, therefore, to be conservative, the estimates for 1981 and 1982 were projected to equal 43,460,000 pounds as well (higher landings of quahogs have the effect of reducing surf clam prices, all other factors held constant). Estimates of inshore, FCZ, and quahog revenues were distributed among the vessel classes based on their 1979 catch distributions, since their 1980 distributions were distorted by the increased landings of small clams.

Total Industry Landings, Revenues, and Prices With Size Limit, 1981-1982
(landings/revenues in thousands of pounds/dollars, price in \$/lb.)

<u>Year</u>	<u>Landings</u>	<u>Revenues</u>	<u>Price</u>	<u>Landings</u>	<u>Revenues</u>	<u>Price</u>	<u>Total Revenues</u>
1981	35,137	22,985	.654	43,640	13,092	.30	36,077
1982	35,137	25,403	.723	43,640	13,092	.30	38,495

Inflation adjusted Values (1967 \$)

1981	7,765	.221	4,408	.101	12,173
1982	7,849	.223	4,059	.093	11,908

Impacts of Size Limit on 1981-1982 Earnings by Vessel Class
(dollar values in thousands)

	<u>Class 1</u>		<u>Class 2</u>		<u>Class 3</u>	
	13		49		61	
No. of Vessels	3		4		5	
Crew Size	3		4		5	
Year	1981	1982	1981	1982	1981	1982
Vessel Class Revenues	\$1995	\$2205	\$7148	\$7840	\$26938	\$28451
% of Total Revenues	5.4	5.7	19.8	20.4	74.7	73.9
Average Revenue	\$ 153	\$ 170	\$ 146	\$ 160	\$ 433	\$ 466
Total Crew Share	\$ 46	\$ 51	\$ 44	\$ 48	\$ 130	\$ 140
Crew Share	\$ 15	\$ 17	\$ 11	\$ 16	\$ 26	\$ 28

Inflation Adjusted Values (1967 \$)

Vessel Class Revenues	\$ 674	\$ 625	\$2286	\$2314	\$ 9087	\$ 8768
% of Total Revenues	5.6	5.3	19.0	19.8	75.4	74.9
Average Revenue	\$ 52	\$ 48	\$ 47	\$ 47	\$ 149	\$ 144
Total Crew Share	\$ 16	\$ 14	\$ 14	\$ 14	\$ 45	\$ 43
Crew Share	\$ 5	\$ 5	\$ 4	\$ 4	\$ 9	\$ 7

The major difference between the impacts of maintaining the existing Plan versus a Plan with a size limit is an increase in average price of surf clams, and, thus, total industry revenues. With the size limit, surf clam prices (adjusted for inflation) are forecasted to be \$.221 and \$.223 per pound for 1981 and 1982, respectively. Both of these prices are below the 1979 price of \$.232/lb. However, since 1977 surf clam prices have been declining and the forecast for 1982 counters that trend. These prices are 16% higher than the forecasted prices of maintaining the existing Plan. Because of the higher surf clam prices and the differing assumptions concerning surf clam and ocean quahog landing, the differences in forecasted industry revenues for 1981 and 1982 between maintaining the existing Plan versus one with a size limit are both \$1.62 million. However, both the base forecast and the size limit forecasts are biased. As discussed previously the forecast of maintaining the existing Plan without a size limit produces prices and revenue estimates that are probably too low. It assumes that small clams for the years 1981 and 1982 will be taken at the same rate as in 1980. Many of these clams were taken from areas now closed to fishing. Therefore, unless there are areas of small clams in great enough abundance, it would be expected that fewer small clams will be harvested. Harvesting fewer small clams implies that the average real surf clam price would increase. In the short run, the taking of small clams reduces the available quota remaining for large clams, causing a shortage of large clams. This would also drive up the average price of clams. Finally, the taking of small clams reduces directly the availability of large clams at some future time. This again would cause an increase in the average price of surf clams.

Another factor that would tend to lessen the impact of the size limit over the values forecasted is the probable opening of some currently closed areas in 1982. These areas contain large numbers of surf clams in very dense beds. As these areas are opened, the supply of large clams will increase and production costs will decrease (because of the high densities). Both of these factors would lower the price of large clams and, thus, the price of all clams.

While the model is statistically sound, the analysis is based on only one year of structural change as well as assumed levels of catches. Because of these biases and because the forecasted prices of surf clams

with the size limit are lower than their actual 1979 levels (when no size limit was in effect), the impacts of the size limit are probably considerably less than predicted.

4. Change in Quarterly Quotas

Under the current Plan, quotas are highest in the summer quarters. This allocation was intended to minimize distributional impacts resulting from the fact that smaller vessels cannot operate as effectively in the winter as larger vessels. However, the surf clam market traditionally has been weak in the summer and strongest in the winter. There have been quarters when the higher summer quotas were not harvested while the winter quotas were exceeded.

Quarterly Quotas (in thousands of bushels)

<u>Year</u>	<u>Quarter¹</u>	<u>Plan Quota</u>	<u>Adjusted Quota²</u>	<u>Estimated Extent of Overfishing</u>
1978	1	350	350	+21
	2	550	529	+17
	3	550	523	-33
	4	350	388	+50
1979	1	350	300	0
	2	550	550 ³	0
	3	550	550 ³	-140
	4	350	490	0
1980	1	400	400	+40
	2	500	460	-90
	3	500	590	-30
	4	400	430	+45
1981	1	400	355	

1. Quarters are: 1 = Jan. - Mar., 2 = April - June, 3 = July - Sept., 4 = Oct. - Dec.
2. Regional Director may adjust quarterly quotas by extent previous quarterly quota was exceeded or underfished.
3. Quarterly quotas were not adjusted for underfishing during these quarters.

Source: NMFS, NEREIS, Status of MFCMA Regulated Shellfish Fisheries.

To forecast the impacts of equal quarterly quotas, a quarterly nominal price model was developed (see Appendix A). Quarterly prices were predicted under the assumption that the estimated level of inshore landings (the difference between total quarterly landings and reported FCZ landings for 1980) would be constant over the forecast period. It was assumed that under each quota system the quota would be caught. These forecasts lead to the conclusion that there is essentially no difference in total surf clam revenues (inshore and FCZ) between the systems.

Quarterly FCZ Surf Clam Revenues (\$1000) and Prices (\$/lb.), 1981-1982

<u>Year</u>	<u>Quarter</u>	<u>Unequal Quarters</u>		<u>Equal Quarters</u>	
		<u>Price</u>	<u>Revenue</u>	<u>Price</u>	<u>Revenue</u>
1981	1	.475	3230.0	.477	3649.1
	2	.496	4216.0	.508	3886.2
	3	.497	4224.5	.492	3763.8
	4	.450	3060.0	.440	3366.0
	Total			14730.5	
1982	1	.439	2985.2	.441	3373.6
	2	.459	3901.5	.470	3595.5
	3	.448	3808.0	.460	3519.0
	4	.421	2862.8	.411	3144.2
	Total			13557.5	

These FCZ revenues were then distributed among each vessel class according to their percentage of the 1980 quarterly catches. These quarterly distributions were then summed to produce the annual figure for

1981. The 1982 results are similar.

Distribution of 1981 FCZ Revenues (\$1000) by Vessel Class

Class	Unequal Quarters		Equal Quarters	
	Revenues	%	Revenues	%
1	561.2	3.81	557.2	3.80
2	3528.1	24.63	3566.6	24.32
3	10541.1	71.56	10541.3	71.88
Total	14730.5	100.00	14665.1	100.00

It can be concluded that going to equal quarters does not change either the distribution of revenues among vessel classes or total FCZ revenues. Since the wholesale prices of clams are traditionally higher in the colder quarters, higher quotas in the colder months should produce benefits for not only the processor, but the consumer as well, with no resulting impact on the harvester.

In summary, given the seasonal demand, the strategy of uneven quarterly quotas apparently was not effective. Even quarters coupled with liberalization of the make-up day provision should provide all vessels increased opportunity to fish when demand is best along with a more realistic system of quarterly allocations.

5. Effort Restrictions

Alternatives 1, 3, 8, and 9 would eliminate hourly effort restrictions. Alternatives 2 and 4 would retain effort restrictions. Alternative 4 differs slightly from alternative 2. In alternative 2, each quarter would begin with no more than 24 hours per week of fishing, the same as the current Plan. Frequently what has happened is that the first week of each quarter has started at 24 hours while the preceding and following weeks were set at higher levels because there was no real need to limit harvesting to 24 hours per week. With alternative 4 there would be no need to begin a quarter at a specified rate. As shown in Table 4, there have been changes to fishing hours at the beginning of quarters with adjustments soon thereafter. Alternative 4 would eliminate these unnecessary changes.

Without good cost, revenue, and production models, it is unclear which vessel class is the most profitable or efficient. Many Class 3 vessels have superior harvesting capacities, but many of these same vessels are recently constructed and therefore have high mortgage and insurance costs and also probably use proportionally more fuel. These considerations must be taken into account before the efficiency impacts of this alternative can be analyzed. However, removing effort restrictions while keeping quarterly quotas would probably lead to closures. Closures, besides having negative impacts on harvesters, also create shortages for processors (and processing plant unemployment) and possibly for consumers.

Two likely distributional impacts on the harvesting sector seem evident with alternative 3 relative to alternatives 2 and 4. The first would probably be an increased shift in the share of total revenues from Class 2 to Class 3 vessels. The revenue share of Class 2 vessels fell 10% for the period 1978 to 1979 while the Class 3 share increased by the same amount (see Table 14). With no effort restrictions, this shift in total industry revenue share would become more pronounced. The second impact probably would be a declining share of total catch and revenues by the independent vessels as processors would have relatively few constraints in using their own vessels to meet their raw product demand.

Since the existing hourly regulations have been generally accepted in the industry and no closures have occurred since 1978, the modified effort restrictions set forth in alternative 4 have been adopted.

6. Expanding the Fishing Week

Alternative 4 provides for an expansion of the fishing week to 4½ days from 4 days. Prior to implementation of the Plan, processors were utilizing their plants on the basis of a normal 5 day work week. Under the existing Plan, vessels cannot begin until 5 pm Sunday, so plants do not get raw material until Tuesday. Since fresh clams cannot be held over weekends, the plants are effectively limited to operating Tuesday through Friday. By allowing fishing to begin at 6 am Sunday, it would be possible for vessels to land clams so plants could begin processing operations on Monday, thus reducing the need for overtime employment.

The primary reason that the fishing week was not expanded to more than 4½ days was to minimize the enforcement burden.

Since the expansion of the fishing week has no apparent negative impacts while allowing the processors to utilize more efficiently plant and equipment, this alternative has been adopted.

7. Bad Weather Make-Up Day

A bad weather make-up day was implemented for the first time in 1980 for the period December through March. It is proposed to expand this system to November through April. The make-up day concept was introduced to solve the problem created when fishermen were required to select certain days of the week when they wanted to fish and were not permitted to change those during a quarter. If bad weather conditions existed on a vessel's designated day, the operator had to forego the opportunity to fish for that period or risk fishing in bad weather conditions. There is also some reason to believe that dredging operations in bad weather conditions leads to excessive damage to unharvested clams because of the difficulty of keeping the dredge on the bottom in high seas. As shown in the following table, the make-up day provision slightly increased the share of the catch going to the smaller vessel classes. It is expected that the addition of two months to the period during which the make-up day is operational will not significantly change current distributional patterns because November and April generally do not have weather conditions as severe as the other months of the make-up period. It must be remembered that this provision will give all vessels an opportunity to harvest.

Distribution of Catch by Vessel Class, 1st Quarter, 1979 and 1980

<u>Class</u>	<u>1979</u>	<u>1980</u>
1	2.9%	3.8%
2	19.7	24.4
3	77.4	71.8

8. Reopening of Closed Areas

There are two alternatives that concern the reopening of closed surf clam areas. Both would distribute catches more evenly among the resource areas and control possible negative impacts of the reopening of closed areas on the harvesting and processing sectors. However, no firm, biological assessments of these closed areas have been provided so that the impacts of their reopening cannot be quantified. All that is known is that there are significant amounts of surf clams in some of the existing closed areas and that portions of some of the areas will be candidates for reopening in 1982.

The first proposal, alternative 6, divides the resource into two separate areas north and south of a line essentially eastward from the mouth of Delaware Bay. Separate quotas for each area would be developed, including estimated catches from reopened areas. Each harvester would notify the NMFS of the area he wanted to fish in each quarter. Effort limitations would then be set based on the number of vessels that wanted to fish in each area. This procedure is intended to mitigate the distributional impacts associated with some vessels having home ports closer to reopened areas than other vessels. It would also tend to spread the fishery geographically as discussed in Section XII-3.

Alternative 7 creates special management areas for each reopened area. Prior to each year, areas to be reopened would be identified, their allowable catches estimated, and the date and length of reopening specified. Effort within these areas would be restricted so that the beds would not be damaged. When the catch per unit of effort in the reopened area dropped to the catch per unit of effort in the fishery generally, it would cease to be a special management areas.

Either alternative would be costly to implement. With respect to the general economics of the fishery, alternative 7 provides more stability and, therefore, is less likely to negatively impact the fishery. Under alternative 6, effort restrictions in the entire area would be the same, so fishing periods could be quite small if the reopened area was very dense. Also, large vessels might benefit to the greatest extent. Alternative 7 would avoid these impacts since effort restrictions in the general fishery would not be affected by activities in the reopened area.

9. Establishing Quotas Within the OY Ranges.

The surf clam and ocean quahog quotas will be set annually through a consultative process. For surf clams in the Mid-Atlantic, the quota will range from 1.8 to 2.9 million bushels (30 to 50 million pounds of meats). The New England surf clam quota will range from 25 to 100 thousand bushels (425 to 1,700 thousand pounds of meats). The ocean quahog quota will range from 4.0 to 6.0 million bushels (40 to 60 million pounds of meats).

The quota for surf clams in the New England area is so much smaller than either the Mid-Atlantic surf clam or the ocean quahog quota that changes in the quota are no significant or measurable by this analysis at the national level.

The quota ranges have been selected because they represent both reasonable estimates of the probable ranges of abundance for the species in the foreseeable future, and because they approximate, in sum and individually, the capacity of the industry at its upper and lower bounds to harvest, process, and market products made from surf clams and ocean quahogs.

The analysis which follows examines alternative quotas on a comparative, short run basis. Since the quotas will vary annually with the condition of the resource, long run analysis of any quota level is impractical.

In general, we expect that increasing the surf clam quota will reduce surf clam prices to the vessels and for consumers, while increasing total industry revenues, revenues by vessel class, and crew shares. Industry profits should increase as a function of the increased operating efficiency possible from higher harvest allocations which should allow more fishing time, and reduce the probability of closures which idle vessels, plants, and equipment. This assumes that some form of entry limitation continues in force, since free entry into the fishery would tend to dissipate the positive effects of increased quotas on industry profits as the expanded quotas would be shared by a greater number of operators and fishing time would probably have to be further reduced.

The following table evaluates the change in surf clam revenues and prices as the surf clam quota is increased, assuming the 1981 forecasted levels of ocean quahog landings, per capita disposable income, and the continued application of a 5.5 inch surf clam minimum size (See RIR 15-17).

Surf Clam Quota (pounds)	Surf Clam Price (\$/pound)	Vessel Revenues (Million \$)	Change in Revenues (Marginal %)
30,000,000	.663	19.9	--
35,000,000	.654	22.9	15.2
40,000,000	.648	25.9	13.2
45,000,000	.642	28.9	11.7
50,000,000	.633	31.7	9.7

Projected vessel class revenues, average gross revenues, and crew shares under three surf clam quota alternatives are given below. The analysis draws on the figures developed on RIR 11, with the assumptions that each vessel class exploits the increased quotas proportional to its exploitation of the current quota, and that revenues from other species are constant.

Vessel class	I			II			III		
	30	40	50	30	40	50	30	40	50
No. of vessels	13			49			61		
Crew size	3			4			5		
Quota (million lbs.)	30	40	50	30	40	50	30	40	50
Class revenues*	1780	1998	2189	7017	8343	9625	24784	28725	32534
Average gross*	127	153	168	143	170	196	406	471	533
Total crew share*	41	46	51	43	52	59	122	141	160
Average crew share*	14	15	17	11	13	15	24	28	32

* in \$1,000.

For each vessel class under each quota option increased quotas provide increases in all financial performance indicators.

Each increase in the surf clam quota should be accompanied by a reduction in the average ex-vessel price per pound of surf clam meat. For example, an increase from a 30 to a 40 million pound quota would reduce average meat prices to processors by slightly more than 2%. An increase from a 30 to a 50 million pound quota would reduce average meat prices to processors by about 5%.

We do not presently have enough information about processing operations and value added to quantitatively project changes in consumer prices. Processors would pay less per unit for their raw material as the quota increases. They might choose to pass this reduction on to consumers or to retain it to increase their own profitability.

The Regulatory Analysis prepared for Amendment #2 to the Plan included estimated employment response functions for the processing sector. For each 42,000 pound change in shucked clam meat output, employment in the processing sector can be expected to change by one man year. Thus, 238 employees might be added if the surf clam quota were raised to 40 million pounds, and 476 employees might be added with a 50 million pound quota. Additional employment gains would accrue in plants producing finished surf clam products. These gains would depend on the product mix, varying with that mix. On average, however, a 77,000 pound change in finished output would lead to a one man year change in employment. The combined employment increased in shucked and finished product processing plants with a 40 million pound quota would thus be 368 man years or 19%. With a 50 million pound quota the increase would be 736 man years or 30%.

The effects of increasing the ocean quahog quota from 4.0 million bushels cannot be determined very closely since the industry is only now approaching full utilization of the lower end of the quota range.

The ex-vessel price of ocean quahogs has remained constant despite considerable fluctuations in production. The following table projects vessel class revenues, average gross revenues, and crew shares under three ocean quahog quota alternatives. The analysis draws on the figures developed on RIR 11, with the assumptions that each vessel class exploits the increased quotas proportional to its exploitation of the current quota, and that revenues from other species hold constant

Vessel class	I			II			III		
	40	50	60	40	50	60	40	50	60
No. of vessels	13			49			61		
Crew size	3			4			5		
Quota (million lbs.)	40	50	60	40	50	60	40	50	60
Class revenues*	1786	1797	1808	7118	7286	7455	26791	30137	33483
Average gross*	137	138	139	145	149	152	439	494	549
Total crew share*	41	42	42	44	45	46	133	150	166
Average crew share*	14	14	14	11	11	12	27	30	33

* in \$1,000.

For each vessel class under each quota option increased quotas provide increases in all financial performance indicators.

The employment response function for ocean quahogs differs from that calculated for surf clams because of differences in automation and yield. For each 90,000 pound change in shucked quahog meat output, employment in the processing sector can be expected to change by one man year. A change in final product output of 77,000 pounds would cause a one man year change in employment. The employment ramifications of alternate quahog quotas are as follows (in additional man years compared to present levels):

Quota (million lbs.)	40	50	60
Shucking employment	131	242	353
Finished employment	153	283	413
Total employment	284	525	766

The ocean quahog industry developed during a period of surf clam scarcity. With a minimum size limit for surf clams set a 5.5 inches, the potential for serious market interaction of surf clam products with products derived from ocean quahogs will probably be reduced as each species will tend to be used to produce final products which make the best use and maximize the value of the raw material.

Consequently, we cannot assess the effects of an increase in the surf clam quota on ocean quahog production, or an increase in the ocean quahog quota on surf clam production. Such an analysis would imply that management was being used to restrict or inhibit the development of one sector of the industry over another, which is neither desirable nor intended.

Impacts of the Preferred Alternative On Vessel Costs

Three main variable cost categories are maintenance, fuel, and labor. None of the preferred alternatives have any noticeable impacts on maintenance or labor costs since none of the alternatives restricts physical inputs. The only alternative that may have impacts on fuel costs are the size limit, hourly effort restrictions, and the extension of the bad weather make-up day. Since harvesters are coming from ports as far as Ocean City, MD to harvest small clams near Atlantic City, NJ, and can easily fill their capacities in one 12 hour trip, the short run impacts of the size limit on fuel costs would be minimal. In the long run, with the size limit and an expanding resource, fuel costs should decrease as fishermen harvest beds closer to their home port. Effort restrictions and fishing hours are used to prevent early closures of the fishery. These restrictions, relative to no hourly restrictions, should reduce fuel costs as they reduce the need for harvesters to race to get their share of the quota before a closure. In addition, the Amendment provides that if the allowable fishing times are reduced to a level so that regulating hours per week results in uneconomic trips, the Regional Director may limit fishing based on hours per month or per quarter, thus saving fuel.

Finally, the expansion of the bad weather make-up day to two additional months should reduce fuel costs for those boats which would otherwise attempt to fish on inclement days. In sum, the preferred alternative in the short run should not impact vessel costs and in the long run is likely to reduce costs by increasing numerically and geographically the available resource.

III. CONCLUSIONS

All of the proposed alternatives were analyzed relative to maintaining the existing Plan. The alternatives that were found to have significant impacts were allowing the Plan to lapse, creating separate management areas for reopened surf clam areas, imposing a 5.5" size limit, and limiting entry. Only the latter 3 alternatives are adopted.

The adopted alternative is to continue the existing Plan, but modify it by imposing a 5.5" size limit, expanding the fishing week to 4½ days, expanding the bad weather make-up day provision to November and April, replacing the moratorium with a permit limitation system, and creating separate management for reopened areas.

Allowing the Plan to lapse would lead to over-exploitation, further overcapitalization, reduced earnings in the harvesting sector and processing sector, and higher consumer prices.

The creation of separate management areas for reopened surf clam areas would minimize distributional and long run negative economic and biological impacts of reopening these areas.

Adoption of the 5.5" size limit will optimize yield per recruit and prevent excessive harvests of immature surf clams. The preliminary forecast indicated that, relative to the existing Plan, the adoption of the size limit will increase ex-vessel prices for surf clams by 16% and increase the revenues to the industry (inshore surf clams, FCZ surf clams, and ocean quahogs) by \$1.6 million, adjusted for inflation. (In 1979 total industry revenues were \$12.1 million, adjusted for inflation, and prices were higher.) However, the forecasting model was considered biased upwards for it places too much weight on the events that occurred within the 1980 fishery. Therefore, it is felt that the model vastly overestimated the incremental impacts of the size limit.

Ex-vessel revenues are not expected to increase by more than \$1 million (in real terms) in any one year and, therefore, any multiplier effects that track through the processing, wholesale, and retail sectors are small enough that the net effect upon the national economy is probably far less than \$5 million.

As indicated above, the size limit may result in price increases relative to the current Plan. The procedures for reopening closed areas may increase governmental (enforcement) costs, but the size limit should reduce enforcement costs relative to monitoring closed areas adequately at sea. In summary, it is

felt that the size limit, in conjunction with the other recommended measures, should result in incremental impacts of less than \$1 million annually. It is unlikely that the adopted alternative will increase prices by more than 10%.

The adopted alternative should have a positive impact on competition since it replaces the moratorium with an entry limitation system. The adopted alternative could force marginal operators out of the fishery, but it would prevent such operators from holding in perpetuity a right gained in the past at the expense of new entrants.

The adopted alternative should not have an adverse impact on total investment. Replacement of the moratorium with the permit limitation system establishes the possibility of new entrants and, therefore, new investment.

As discussed above, the adopted alternative should not have an adverse impact on productivity. No user group should face reductions in its gross revenues of 10% or more and any reduction in gross revenues would be far less than \$1 million.

The adopted alternative should have no impact on exports.

The three adopted alternatives that have significant impact (separate management areas for reopened surf clam areas, the 5.5" surf clam size limit, and imposition of a limited entry system) are all likely to produce net benefits to the fishery, the region, and the national economy. All have positive resource conservation impacts that should increase the long run supply of clams, reduce their prices, and favorably impact employment. All have positive economic impacts in that they tend to decrease the level of economic instability in the fishery, allocate the resource toward its highest valued use, and decrease the excessive amount of inputs that would be used if the present Plan were continued or if the fishery were to return to an unregulated state.

APPENDIX A. EX-VESSEL SURF CLAM AND OCEAN QUAHOG PRICE AND LANDING FORECASTING EQUATIONS

Annual Surf Clam Ex-Vessel Price Model

Table A-1 presents the annual ex-vessel surf clam price model used in the analysis. All variables have the expected sign and, except for the constant, are significant at the .01 level of significance. To control for the price effects of the initial substitution of small surf clams for ocean quahogs in 1980, a dummy variable (DUM80) was used to test for this structural change. It is expected that this variable would have a negative sign since small clams are much lower in price relative to large clams and therefore any increase in the percentage of small clams landed should drive the average price of all clams downward. The regression shows that DUM80 was significant and of the correct sign. To forecast the effects of maintaining the existing Plan, this variable was assumed to equal 1. The forecast of the effects of the size limit assumed that a size limit would constrain the 1980 capture rate of small clams and therefore the variable was assumed to equal 0.

Table A-1. Annual Ex-Vessel Surf Clam Price Model

<u>Dependent Variable</u>	<u>Constant</u>	<u>Regression Coefficients</u>				
RRSP	C	SPC	QPC	DPY	DUM	DUM80
	-.0126	-.000105	-.000335	5.279	.1670	-.04495
(t values)	(-1.85)	(-3.63)	(-4.15)	(7.59)	(20.2)	(-4.81)

$R^2, \bar{R}^2 = .99$ D.W. = 1.98

- RRSP = deflated ex-vessel surf clam price (\$/lb.)
- SPC = per capita surf clam supply (lbs./1000)
- QPC = per capita ocean quahog supply (lbs./1000)
- DPY = deflated per capita income (\$1000)
- DUM = 1960 - 1975 = 0, 1976 - 1980 = 1
- DUM80 = 1960 - 1979 = 0, 1980 = 1

Quarterly Surf Clam Ex-Vessel Price Model

Table A-2 presents the quarterly ex-vessel surf clam price model used in the analysis. This model used data for the period 1976-1980. Two dummy variables were utilized: PDUM and D76. PDUM equals 1 for the period 1977.3 - 1978.1, while D76 equals 1 for the period 1976.1 - 1976.4. Both of these variables control for structural differences in the fishery. PDUM controls for existence of abnormally high levels of inventories that were built up prior to implementation of the Plan such that the demand for clams by processors during 1977.3 - 1978.1 was reduced, causing prices to fall. D76 attempts to control for the level of reaction of the industry to the implementation of the Plan. Since the Plan was not approved until November, 1977, it is expected that relative to 1977, the incentive of the industry to build up inventories would not be as high because the Plan was just being formulated. Thus, the prices for 1976.1 - 1976.4 were lower than clam prices for 1977.1 - 1977.2.

The only variable that has a sign that differs from expectations is the income variable. This can be attributed to: (1) surf clams are an inferior good such that as peoples' incomes increase they substitute other fishery products such as breaded shrimp, breaded fillets, or fresh fish for surf clam products, or (2) there is systematic multicollinearity or heteroscedasticity within the data such that the income variable has the incorrect sign. (It was decided to leave the income variable within the model because it increased the predictive capability of the model using the R^2 when adjusted for the number of variables as a criterion.) All variables are significant at the 0.05 level, however, the high Durbin Watson statistic indicates that the existence of negative autocorrelation cannot be rejected. Therefore, the coefficients

are biased. Since the main purpose of developing this model was to compare alternative quarterly quota regulations and not to forecast quarterly prices, it is assumed that correction of the bias, if possible, would not change the basic conclusions of the analysis.

Table A-2. Quarterly Surf Clam Price Model

Dependent Variable	Constant	Regression Coefficients							
		D2	D3	D4	LQSL	LQQP	LQDPY	PDUM	D76
LQSP	C	.17	.13	.07	-.28	1.86	-.67	-.25	-.11
(t values)	(5.03)	(4.89)	(3.76)	(2.31)	(-3.02)	(8.83)	(-4.73)	(-6.90)	(-2.44)

$R^2 = .95, \bar{R}^2 = .91, D.W. = 2.69$

LQSP = natural log of quarterly surf clam prices (nominal)

D2 = 1 for spring quarters, else 0

D3 = 1 for fall quarters, else 0

D4 = 1 for winter quarters, else 0

LQSL = natural log of quarterly surf clam landings (1000 lbs.)

LQQP = natural log of quarterly quahog prices (nominal)

LQDPY = natural log of quarterly per capita disposable income (\$1000)

PDUM = 1 for 1977.3 - 1978.1, else 0

D76 = 1 for 1976.1 - 1976.4, else 0

Annual Quahog Landings Model

The model predicts quahog landings as a function of time. It was used to predict quahog landings for 1980, assuming that the substitution of small surf clams for quahogs did not take place.

Table A-3. Quahog Landings

Dependent Variable	Constant	Regression Coefficients		
		Time	DUM	DT
Qual	C	112.4	-689537	9138.99
(t values)	(-2.12)	(2.33)	(-22.3)	(22.8)

$R^2, \bar{R}^2 = .99, D.W. = 2.75$

Qual = quahog landings (1000 lbs.)

Time = 1960 = 60, 1961 = 61, ..., 1979 = 79

DUM = 1960 - 1975 = 0, 1976 - 1979 = 1

DT = Time X DUM

Forecasts Used for Exogenous Variables

<u>Year & Quarter</u>	<u>Quarterly Disposable Income</u> <u>(current \$, millions)</u>	<u>Wholesale Price Index</u>
1981.1	1948.6	285.5
1981.2	2003.8	292.4
1981.3	2082.8	299.3
1981.4	2136.7	306.8
1982.1	2193.5	315.2
1982.2	2245.2	321.4
1982.3	2303.3	326.7
1982.4	2363.5	333.4

Annual forecasts were based on the average of the quarterly forecasts. Quarterly forecasts were taken from Chase Econometric Forecasts, 26 January 1981.

Annual population for 1981 and 1982 was assumed to grow at the same rate as from 1979 - 1980. Population forecasts for 1981 and 1982 are 224.9 and 227.0 million, respectively.

Data

Landings and revenues for surf clams and ocean quahogs are from NMFS.

Income, wholesale prices (all commodities), and population data were taken from Data Series 330, 224, 225, and 227 of the Business Conditions Digest, Bureau of Economic Analysis, US Dept. of Commerce.

APPENDIX B. COSTS AND EARNINGS OF FISHING VESSELS 1979

Although a number of individuals and firms have provided detailed information regarding income and expense accounting items, the number of vessels in the sample is insufficient to provide a detailed analysis and description of the industry as a whole. Therefore, an effort has been made to generate income and expense profiles for the fleet on an individual vessel basis using estimates based on general relationships observed of the costs of vessel operation. Fixed costs and variable operating costs have been assigned using general relationships applied on an individual vessel basis with inputs derived from the information supplied with permit applications and weekly logbook catch reports.

Income and expense items for the typical clam vessel are defined as follows:

Gross Stock = Total revenue

Fixed Costs = Administrative costs
Tax and license
P & I insurance
Hull insurance
Depreciation
Interest

Variable Costs = Maintenance
Fuel
Labor
Miscellaneous

To obtain accurate estimates for each vessel on certain major cost components would require substantially more information than is available. Charges for hull insurance, maintenance, depreciation, and interest are unique to each vessel and are determined by its age, construction, activity, type of owner, and length of current ownership of the vessel. Although these four cost items differ in magnitude among vessel groups, the total of all four items tends to remain the same, given the size of the vessel. Individual differences in the amount apportioned to each item tend to cancel out among the vessels. For example, a new steel hulled vessel would have low hull insurance and maintenance costs, and very high depreciation and interest costs. An old wooden hulled vessel would have very high insurance and maintenance costs, and very low (if any) depreciation and interest costs.

These expenses are also determined largely by the owners' operating strategy. Some owners may prefer to operate new equipment with low maintenance and insurance costs, and high depreciation and interest costs. Others may prefer to work with older equipment which has low depreciation and interest costs, offset by higher maintenance and insurance costs. Some owners may prefer to prolong the life of their investments and assure its security with maintenance and hull insurance. For others, these items may represent an unacceptable current operating expense, and the vessel may go without maintenance and be self-insured.

What appears to be a reliable method of assigning hull insurance and maintenance values has been developed based on schedules representing older vessels. These schedules provide an allowance for depreciation and interest charges which, on newer vessels, take the place of maintenance and insurance costs. Therefore, while no explicit reductions have been made for depreciation or interest, it is assumed that the sums deducted for insurance and maintenance will, in most cases, cover these expense items.

Method of Calculation of Income and Expense items

Hull insurance, maintenance, depreciation, and interest were calculated as one lump cost. The cost was assigned based on the vessel's tonnage and landings as follows: 7% of the value of the vessel. The vessel value was determined according to its size.

<u>Tonnage</u>	<u>Value</u>
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

This sum is added to an amount based on size and landings value:

<u>Tonnage</u>	<u>Landings</u>	<u>Charge</u>
0-60	0-50	\$25,000
	50-100	30,000
	100+	35,000
61-120	0-50	30,000
	50-100	35,000
	100-150	40,000
	150-200	45,000
	200+	50,000
121+	0-50	30,000
	50-100	35,000
	100-150	40,000
	150-200	45,000
	200-250	50,000
	250-300	55,000
	300-350	60,000
	350+	65,000

Administrative costs were assigned based on the tonnage class and type of ownership of the vessel.

<u>Tonnage</u>	<u>One boat per owner</u>	<u>More than one boat per owner</u>	<u>Vertically integrated operation</u>
0-60	\$ 5,000	\$ 8,000	\$ 10,000
61-120	10,000	13,000	15,000
120+	12,000	15,000	18,000

Tax and license were based on vessel tonnage class:

<u>Tonnage</u>	<u>Charge</u>
0-60	\$1,000
61-100	2,000
101-120	3,000
121+	4,000

P & I insurance was based on the number of men aboard figured by the size of the vessel:

<u>Tonnage</u>	<u>Crew size</u>	<u>Charge</u>
0-75	3	\$5,000
76-120	5	8,000
121+	6-7	10,000

Fuel cost was calculated with a formula which included vessel steaming time, fishing time, and the horsepower of the main and pump engines. While the formula was quite detailed, actual charges generally amounted to 10% of gross revenues.

Labor was calculated as one-third of gross stock.

Miscellaneous charges were based on the tonnage class of the vessel:

<u>Tonnage</u>	<u>Charge</u>
0-60	\$2,000
61-100	3,000
101+	4,000

It is recognized that for each individual vessel these items may not apply or may be quite different. However, as a tool for estimating profiles based on limited input data it is hoped this will provide a reasonable reflection of actual or implied costs.

Gross revenue was calculated based on a vessel's landings and a weighted average price for each harvested species.

Crew Shares

Labor costs, or crew shares, for the fleet as a whole are assumed to represent 1/3 of the gross stock of a vessel. It is recognized that many owner-operated vessels pay crew shares totaling as much as 50% of gross stock, reflecting the owner taking his compensation as a larger crew share in lieu of earning higher income through the vessel operation itself. Some corporate-owned vessels, which pay crew expenses such as personal gear, food, and taxes, pay a lower crew share, from 26 to about 30%. However, if total compensation and benefits paid by the owner to the crew are included, labor costs generally amount to 1/3 of the gross stock.

To calculate individual man shares, the average crew size for a given vessel size was determined, and the crew share was divided by this number. Each gross man share was then adjusted by subtracting an allowance for the cost of food and supplies used by the man on board the vessel, thus arriving at a net man share.

Vessel Class Profiles

The individual vessel profiles generated have been tested with the vessel operators themselves to a limited extent. They appear to be useful in predicting whether a vessel had a net income or loss, and the magnitude of that income or loss. A number of borderline vessels with small net income or loss may have lost or earned income, but the analysis is simply not sensitive enough to determine for sure. In general, the profiles appear to accurately reflect actual circumstances.

Aggregate profiles by vessel class are as follows:

AVERAGE AGGREGATE INCOME AND EXPENSE PROFILES BY VESSEL CLASS, 1979

	Class 1 (21 vessels)	Class 2 (56 vessels)	Class 3 (76 vessels)
GROSS STOCK	\$61,000	\$128,000	\$217,000
Fixed costs:			
Administrative	7,000	11,000	15,000
Tax & license	1,000	2,000	4,000
P & I insurance	5,000	6,000	10,000
Hull insurance	7,000	12,000	27,000
Depreciation	*	*	*
Interest	*	*	*
Total fixed	<u>\$20,000</u>	<u>\$ 31,000</u>	<u>\$ 56,000</u>
Variable costs:			
Maintenance	\$27,000	\$ 37,000	\$ 51,000
Fuel	6,000	13,000	26,000
Labor	20,000	42,000	72,000
Miscellaneous	2,000	3,000	4,000
Total variable	<u>\$55,000</u>	<u>\$ 95,000</u>	<u>\$153,000</u>
TOTAL EXPENSES	\$75,000	\$126,000	\$209,000
NET INCOME	(14,000)	2,000	8,000
EST. NET CREWMAN SHARE	\$ 6,000	\$ 10,000	\$ 11,000

* assumed to be covered by insurance and maintenance charges (see text).

Net Income by Vessel Groupings

Although the estimated net income by vessel class is of a very limited magnitude, there are significant differences among the fleet. In each class there were some vessels which made handsome earnings, and some which shared substantial losses.

**Income by Vessel Class, Profit Vessels versus Loss Vessels, 1979
(income in thousands of dollars)**

Class	Number of Vessels	Number With Profit	Number With Loss	Total Profit	Total Loss	Total Net	Average Net
1	21	4	17	80	(372)	(292)	(14)
2	56	24	32	714	(623)	91	2
3	76	37	39	2,905	(2,271)	634	8
Total	<u>153</u>	<u>65</u>	<u>88</u>	<u>3,699</u>	<u>(3,266)</u>	<u>433</u>	<u>3</u>

In every size class, the number of vessels sharing a calculated loss exceeded the number with a calculated income. However, the average net income for vessels in the medium and large size classes, and for the fleet as a whole, was positive.

Vessels Harvesting Ocean Quahogs

While the performance of the fleet as a whole was rather dismal, certain groups of vessels turned in very impressive balance sheets. In particular, those vessels which harvested some ocean quahogs were far more successful as a group than those which did not. While the general performance of vessels harvesting at least some ocean quahogs is significantly better than the fleet as a whole, an increase in the proportion of total revenue derived from quahog production leads to an increase or is associated with an increase in

average performance. However, when the contribution of ocean quahog landings totals a larger percentage of gross revenues, the trend reverses to some extent.

Income for Vessels Harvesting Ocean Quahogs, 1979
(income in thousands of dollars)

<u>Share of Revenue as Ocean Quahogs</u>	<u>Number of Vessels</u>	<u>Number With Profit</u>	<u>Number With Loss</u>	<u>Total Profit</u>	<u>Total Loss</u>	<u>Total Net</u>	<u>Average Net</u>
Some	51	29	22	2,207	(548)	1,659	33
30%	26	18	8	1,575	(126)	1,449	56
50%	16	14	2	1,404	(41)	1,353	85
70%	12	10	2	878	(41)	837	70

Vessels Harvesting Inshore Surf clams

Reliable vessel income information from the inshore fisheries is available only for vessels working in the State of New Jersey. These vessels tend to be smaller, older, and somewhat removed from the centers of offshore production than the fleet as a whole.

Income from Vessels Harvesting Some New Jersey Inshore Surf Clams, 1979
(income in thousands of dollars)

<u>Number of Vessels</u>	<u>Number With Profit</u>	<u>Number With Loss</u>	<u>Total Profit</u>	<u>Total Loss</u>	<u>Total Net</u>	<u>Average Net</u>
44	12	32	178	(730)	552	(13)

In the case of eight of these vessels, their activity inshore was responsible for turning them from a net negative to a net positive balance. Without the inshore revenues, many of these vessels would have lost large sums of money. The inshore fishery contributed a total net increase in income of \$851,000, or an average supplement to net income of \$19,000 per vessel. The range of supplement was from a low of \$1,000 to a high of \$37,000.

Vessel Group Performance Summary, 1979
(net income and crew share in thousands of dollars)

<u>Class</u>	<u>Group</u>	<u>Number of Vessels</u>	<u>Net Income</u>	<u>Crew Share</u>
1	1	3	\$-49	\$ 0
	2	7	-25	4
	3	8	-6	7
	4	3	27	14
2	1	5	-39	4
	2	15	-19	6
	3	16	-6	9
	4	13	17	14
	5	7	64	19
3	1	20	-85	2
	2	19	-26	8
	3	16	22	13
	4	17	93	20
	5	4	214	30

APPENDIX IV. REGULATIONS*

Subpart A - General Provisions

- 652.1 Purpose.
- 652.2 Definitions.
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Authority: 16 U.S.C. 1801 et seq.

Subpart A - General Provisions

§652.1 Purpose.

This Part regulates fishing for surf clams (Spisula solidissima) and ocean quahogs (Arctica islandica) in the Atlantic Ocean fishery conservation zone.

§652.2 Definitions.

In addition to the definitions in the Act, and unless the context requires otherwise, the terms used in this Part shall have the following meaning:

- (a) Act means the Magnuson Fishery Conservation and Management Act, 16 U.S.C. 1801 et seq.
- (b) Assistant Administrator means the Assistant Administrator for Fisheries of the National Oceanic and Atmospheric Administration, 3300 Whitehaven Street, N.W., Washington, D.C. 20235.
- (c) Authorized officer means:
 - (1) Any commissioned, warrant, or petty officer of the U.S. Coast Guard;
 - (2) Any certified Enforcement or Special Agent of the NMFS;
 - (3) Any officer designated by the head of any Federal or State agency which has entered into an agreement with the Secretary of Commerce or the Commandant of the U.S. Coast Guard to enforce the provisions of the Act; or
 - (4) Any U.S. Coast Guard personnel accompanying and acting under the direction of any person described in paragraph (c)(1) of this definition.
- (d) Bushel means a standard unit of measure presumed to hold 1.88 cubic feet of surf clams or ocean quahogs in the shell.
- (e) Cage means a standard unit of measure presumed to hold 32 bushels of surf clams or ocean quahogs in

*As published in the Federal Register of 29 January 1982 (Vol. 47, No. 20), pp. 4268-4275.

the shell. The outside dimensions of a standard cage generally are 3' wide, 4' long and 5' high.

- (f) Council means the Mid-Atlantic Fishery Management Council.
- (g) Directed fishery means, with respect to any species, a fishery conducted for the purpose of catching that species.
- (h) Fish means any finfish, mollusks (including surf clams and ocean quahogs), crustaceans, and all other forms of marine animal and plant life other than marine mammals, birds, and highly migratory species.
- (i) Fishery Conservation Zone (FCZ) means the zone contiguous to the territorial sea of the United States, 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.
- (j) Fishing means:
 - (1) The catching, taking, or harvesting of fish;
 - (2) The attempted catching, taking, or harvesting of fish;
 - (3) Any other activity which can reasonably be expected to result in the catching, taking, or harvesting of fish; or
 - (4) Any operations at sea in support of, or in preparation for, any activity described in paragraph (j)(1), (2), or (3) of this section.

The term "fishing" does not include any scientific research activity which is conducted by any scientific research vessel.

- (k) Fishing trip means a departure from port, transit to the fishing grounds, fishing, and discharge of any part of the catch on board.
- (l) Fishing vessel means any vessel, boat, ship, or other craft which is used for, equipped to be used for, or of a type which is normally used for:
 - (1) Fishing; or
 - (2) Aiding or assisting one or more vessels at sea in the performance of any activity related to fishing, including, but not limited to, preparation, supply, storage, refrigeration, transportation, or processing.
- (m) Mid-Atlantic Area means that portion of the FCZ in the Atlantic Ocean south of a rhumb line connecting the point 41°18.27' N. latitude and 71°54.47' W. longitude with the point 38°03.4' N. latitude and 68°41.7' W. longitude, the outward boundary of the FCZ.
- (n) New England Area means that portion of the FCZ in the Atlantic Ocean north of a rhumb line connecting the point 41°18.27' N. latitude and 71°54.47' W. longitude with the outward boundary of the FCZ at 38°03.4' N. latitude and 68°41.7' W. longitude.
- (o) NMFS means the National Marine Fisheries Service of the National Oceanic and Atmospheric Administration.
- (p) Operator means, with respect to any vessel, the master or other individual on board and in charge of that vessel.
- (q) Owner means, with respect to any vessel:
 - (1) Any person who owns that vessel in whole or in part;

- (2) Any charterer of the vessel, whether bareboat, time, or voyage; or
 - (3) Any person who acts in the capacity of a charterer, including but not limited to parties to a management agreement, operating agreement, or any similar agreement that bestows control over the destination, function, or operation of the vessel.
- (r) Person means any individual, corporation, partnership, association, or other entity.
 - (s) 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 per person per trip.
 - (t) Regional Director means the Regional Director, Northeast Region, NMFS, Federal Building, 14 Elm Street, Gloucester, Massachusetts 01930-3799. Telephone 617-281-3600.
 - (u) Secretary means the Secretary of Commerce or the designee of the Secretary.
 - (v) Vessel of the United States means:
 - (1) A vessel documented or numbered by the Coast Guard under United States law; or
 - (2) A vessel, under five net tons, which is registered under the laws of any State.

§652.3 Foreign Fishing

Fishing for surf clams or ocean quahogs in the FCZ by any vessel other than a vessel of the United States is prohibited.

§652.4 Permits.

(a) General.

- (1) Requirement. A vessel owner or operator must obtain a permit in order to:
 - (i) Conduct a directed fishery for surf clams or ocean quahogs within the FCZ, or
 - (ii) Land or transfer to another vessel any surf clams or ocean quahogs or part thereof caught within the FCZ.
- (2) Exemption. Vessels taking surf clams or ocean quahogs for personal use are exempt from this section.

(b) Eligibility.

- (1) Surf clams - New England and Mid-Atlantic Areas. 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:
 - (i) The vessel has landed surf clams in the course of conducting a directed fishery for surf clams between November 18, 1976, and November 17, 1977; or
 - (ii) The vessel was under construction for, or was being rerigged for, use in the directed fishery for surf clams on November 17, 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
 - (iii) 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.

- (2) Surf clams - New England Area only. Any vessel of the United States is eligible for a permit allowing it to harvest surf clams in the New England Area only.
 - (3) Ocean quahogs. Any vessel of the United States is eligible for a permit allowing it to harvest ocean quahogs only.
- (c) Application. Permit applications may be obtained by contacting the Regional Director. The owner or operator may apply for a permit by submitting an application form supplied by the Regional Director containing at least the following information:
- (1) Names, mailing addresses, and telephone numbers of the owner and operator;
 - (2) The name of the vessel;
 - (3) The vessel's U.S. Coast Guard documentation number or State license number;
 - (4) Engine and pump horsepower;
 - (5) Homeport of the vessel;
 - (6) Directed fishery or fisheries;
 - (7) Fish hold capacity (in cages or bushels);
 - (8) Dredge size and number of dredges;
 - (9) Amount of surf clams and ocean quahogs landed between November 18, 1976, and November, 17, 1977 (in bushels, if applicable);
 - (10) Number of fishing trips between November 18, 1976, and November 17, 1977;
 - (11) Date of beginning of construction or rerigging (if applicable);
 - (12) Signature of the owner or operator; and
 - (13) Any other information which may be necessary for the issuance or administration of the permit.
- (d) Issuance. The Regional Director will issue a permit to each eligible vessel for which an application is submitted. The eligibility of a vessel to fish for surf clams will be determined consistent with this section. There will be no fee for the permit.
- (e) Appeal of denial of permit.
- (1) Any applicant denied a permit by the Regional Director may appeal to the Assistant Administrator for review of the denial. Any such appeal must be in writing. Any of the following grounds may form the basis for review:
 - (i) Applicant believes denial was in error;
 - (ii) Applicant was prevented by circumstances beyond his control from meeting relevant criteria;
 - (iii) Applicant has new or additional information which might change the initial decision; or
 - (iv) Applicant can show that significant and unusual hardship will result from the denial.
 - (2) The appeal may be presented, at the option of the applicant, at a hearing before a person appointed by the Assistant Administrator to hear the appeal.
 - (3) The decision of the Assistant Administrator will be the final decision of the Department of Commerce.

- (f) Transfer. A permit is valid only for the vessel for which it is issued.
- (g) Display. 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 shall be subject to inspection upon request by any authorized official.
- (h) Expiration. Except as provided in paragraph (h)(2), a permit will expire:
- (1) 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), or
 - (2) 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 criteria of eligibility set forth in §652.4(b). Applications for continuation of a permit must be addressed to the Regional Director.
- (i) Sanctions. Subpart D of 50 CFR 621 (Civil Procedures) governs the imposition of permit sanctions against a permit issued under this Part. As specified in that subpart D, a permit may be revoked, modified, or suspended if the permitted vessel is used in the commission of any offense prohibited by the Act of these regulations; or if a civil penalty or criminal fine imposed under the Act, and pertaining to a permitted vessel, is not paid.

§652.5 Recordkeeping and reporting requirements.

(a) Dealers.

- (1) Weekly report. Any person who buys surf clams and ocean quahogs from a fishing vessel subject to these regulations shall provide at least the following information to the Regional Director on a weekly basis, on forms supplied by the Regional Director:
 - (i) Name and mailing address of dealer or processing plant;
 - (ii) Name and permit number of the vessel from which surf clams or ocean quahogs are landed or received;
 - (iii) Dates of purchases;
 - (iv) Number of bushels purchased, by species;
 - (v) Price per bushel, by species; and
 - (vi) Meat yield per bushel, by species.
- (2) 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) Number of dealer or processing plant employees during each month of the year just ended;
 - (ii) 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; and
 - (iv) An estimate, for the next year, of the capacities described in paragraph (a)(2)(iii) of this section.

If the capacities described in paragraph (a)(2)(iii) of this section change more than ten percent

during any year, the processor shall promptly notify the Regional Director of the change in capacity.

- (3) At-sea activities. All persons purchasing, receiving, or processing any surf clams or ocean quahogs at sea for transport to any port of the United States must submit information identical to that required by paragraphs (a)(1) and (2) of this section and provide those reports to the Regional Director on the same frequency basis.

(b) Owners and operators.

- (1) Daily fishing log. The owner or operator of any vessel conducting any fishing operations subject to these regulations 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; and
 - (xii) Buyer.
- (2) When to fill in log. To the extent possible, owners or operators shall fill out such logbooks before landing any surf clams or ocean quahogs at the end of any fishing trip. All logbook information required in paragraph (b)(1) of this section must be filled in for each fishing trip before starting the next fishing trip.
- (3) Inspection. The owner or operator shall make the logbook 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 during or after a trip.
- (4) Record retention. For one year after the date of the last entry in the log, the owners or operator shall keep each logbook at the owner's or operator's principal place of business.
- (5) Weekly reports. The owner or operator shall submit weekly reports 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.
- (6) Annual reports. All persons required to submit reports under paragraph (b) of this section shall submit annually to the Regional Director, on forms supplied by the Regional Director, at least the following information relating to vessel characteristics: name of the vessel, vessel's U.S. Coast Guard documentation number or State license number, engine and pump horsepower, homeport of vessel, hold capacity (in bushels or cages), and dredge size and number of dredges.

§652.6 Vessel identification.

- (a) Official number. The operator of each fishing vessel 25 feet 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 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 number issued by a State or the Coast Guard for undocumented vessels.
- (b) Markings. Such markings must be at least eighteen (18) inches in height for fishing vessels over 65 feet in length, and at least ten (10) inches in height for all other vessels over 25 feet 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.

§652.7 Prohibitions.

- (a) No permit holder shall catch and retain on board any surf clams or ocean quahogs:
 - (1) During closed seasons; or
 - (2) In closed areas as specified in these regulations; or
 - (3) On days of the week in which fishing for these species is not authorized.
- (b) No person shall fish for surf clams except during the authorized time period(s) assigned to the vessel he is operating.
- (c) No person shall catch and retain on board any surf clams on other than an authorized surf clam fishing trip.
- (d) 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 parts thereof, which were taken in violation of the Act, these regulations, or any other regulations issued under the Act.
- (e) No person engaged in the surf clam or ocean quahog fisheries as an owner or operator, or as a dealer, processor, buyer, or receiver 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 §652.5.
- (f) No person shall:
 - (1) Refuse to permit an authorized officer to board a fishing vessel subject to such a person's control for purposes of conducting any search or inspection, no matter where that vessel may be located, in connection with the enforcement of the Act, these regulations, or any other regulations issued under the Act;
 - (2) Forcibly assault, resist, oppose, impede, intimidate, or interfere with any authorized officer in the conduct of any search or inspection described in paragraph (f)(1) of this section;

- (3) Resist a lawful arrest for any act prohibited by these regulations.
 - (4) Interfere with, delay, or prevent, by any means, the apprehension or arrest of another person knowing or being advised by authorities that such other person has committed any act prohibited by these regulations.
- (g) No person shall use any fishing vessel to engage in fishing without a permit, unless exempted under §652.4(a)(2), or after the revocation, or during the period of suspension, of any applicable permit issued under §652.4.
- (h) No person shall alter, erase or mutilate:
- (1) Any permit issued under §652.4.
 - (2) Any letter of authorization issued under §652.22.
- (i) No person in the Mid-Atlantic Area shall have in his possession surf clams taken in violation of the size limit prescribed in §652.25.
- (j) No person shall violate any other provision of the Act, these regulations, or any applicable permit issued under §652.4.

§652.8 Facilitation of enforcement.

- (a) General. The owner or operator of any fishing vessel subject to these regulations shall immediately comply with instructions issued by the authorized officer to facilitate safe boarding and inspection of the vessel, its gear, logbook, and catch for the purposes of enforcing the Act and these regulations.
- (b) Signals. Upon being approached by a U.S. Coast Guard vessel or aircraft, or other vessel or aircraft authorized to enforce the Act, the operator of the fishing vessel shall be alert for communications conveying enforcement instructions. VHF-FM radiotelephone is the normal method of communicating between vessels. Should radiotelephone communication fail, however, other methods of communication including visual signals, may be employed. The following signals extracted from the International Code of Signals are among those which may be used, and are included here for the safety and information of fishing vessel operators:
- (1) "L" meaning "You should stop your vessel instantly."
 - (2) "SQ3" meaning "You should stop or heave to; I am going to board you." and
 - (3) "AA AA AA etc." which is the call to an unknown station, to which the signaled vessel shall respond by illuminating the vessel identification required by §652.6.
- (c) Boarding. The operator of a vessel signaled to stop or heave to for boarding shall:
- (1) Stop immediately and lay to or maneuver in such a way as to permit the Authorized Officer and his/her party to come aboard;
 - (2) Provide a safe ladder for the Authorized Officer and the boarding party;
 - (3) When necessary to facilitate the boarding, provide a man rope, safety line and illumination for the ladder; and
 - (4) Take such other actions as are necessary to ensure the safety of the Authorized Officer and his/her party to facilitate the boarding.

§652.9 Penalties.

Any person or fishing vessel found to be in violation of these regulations, including the logbook and other reporting requirements, is subject to the civil and criminal penalty provisions and forfeiture provisions

prescribed in the Act, in 50 CFR Parts 620 (Citations) and 621 (Civil Procedures), and in other applicable law.

Subpart B - Management Measures

§652.21 Catch quotas.

- (a) Surf clams: Mid-Atlantic Area. The amount of surf clams which may be caught in the Mid-Atlantic Area by fishing vessels subject to these regulations will be specified annually within the range of 1,800,000 and 2,900,000 bushels. This annual quota will be divided into equal quarterly quotas, the quarters being January 1-March 31, April 1-June 30, July 1-September 30, and October 1-December 31. Each fishing quarter will begin on the first Sunday of the new calendar quarter.
- (1) Establishing quotas. Prior to the beginning of each year, the Regional Director will prepare a written report, based on the latest available stock assessment report prepared by the National Marine Fisheries Service, 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; and
 - (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.
- (2) Public review. Based on the information presented in the report, and in consultation with the Council, the Secretary will propose an annual surf clam quota and will publish it in the Federal Register. Comments on the proposed annual quota may be submitted to the Regional Director within 30 days after publication. The Secretary will consider all comments, determine an appropriate annual quota, and publish the annual quota in the Federal Register.
- (3) Adjustments. If the actual catch of surf clams in any one quarter falls more than 5,000 bushels short of the specified quarterly quota, the Regional Director will add the amount of the shortfall to the succeeding quarterly quotas. If the actual catch of surf clams in any quarter exceeds the specified quarterly quota, the Regional Director shall subtract the amount of the excess from the succeeding quarterly quotas.
- (4) Notice. The Secretary will publish a notice in the Federal Register whenever an adjustment is made to the quarterly quota for surf clams. The Regional Director will send notice of any adjustment of the annual quota to each surf clam processor and to each licensed surf clam vessel operator.
- (b) Surf Clams: New England Area. The amount of surf clams which may be caught in the New England Area by fishing vessels subject to these regulations will be specified annually between 25,000 and 100,000 bushels, using the procedures and criteria set forth in §652.21(a).
- (c) Ocean Quahogs. The amount of ocean quahogs which may be caught by fishing vessels subject to these regulations will be specified annually between 4,000,000 and 6,000,000 bushels, using the procedures and criteria set forth in §652.21(a). If necessary, the Regional Director may establish quarterly quotas for ocean quahogs, which will be based on historical fishing patterns. In that event, the Secretary will publish notice of such quarterly quotas in the Federal Register. In the event that the Regional Director establishes quarterly quotas for ocean quahogs, if the actual catch of ocean quahogs falls more than 5,000 bushels short of the specified quarterly quota, he will add the amount of the shortfall to the succeeding quarterly quotas. If the actual catch of ocean quahogs in any quarter exceeds the specified quarterly quota, the Regional Director will subtract the amount of the excess from the succeeding quarterly quotas.

§652.22 Effort restrictions.

(a) Surf clams. Mid-Atlantic Area.

- (1) The fishing week. Fishing for surf clams will be authorized only during the period beginning 0001 hours Sunday and ending 1800 hours Thursday.
- (2) Hours. The Regional Director will notify each owner or operator of a fishing vessel engaged in the surf clam fishery in the Mid-Atlantic Area concerning the allowable combinations of fishing periods for varying levels of allowable fishing time. All fishing periods will end at 1800 hours. The vessel owner or operator shall send the Regional Director written notice of the owner or operator's selection of allowable surf clam fishing periods for that vessel. All selections must be provided to the Regional Director no less than 15 days prior to the intended effective date. The Regional Director will send a letter of authorization to each owner or operator, stating the periods during which the vessel is authorized to fish for surf clams. The letter of authorization must be kept aboard the vessel at all times. Fishing may be conducted only during the times and under those conditions authorized by the Regional Director in the letter of authorization. Fishing for any part of an authorized period will be counted as one day of fishing. In this paragraph, "fishing" means the actual or attempted catching of fish, but not activities in preparation for fishing, such as traveling to or from the fishing grounds. The presence of a vessel's fishing gear in the water at a time which is more than one-half hour before the beginning, or one-half hour after the end, of the vessel's authorized fishing period shall be prima facie evidence that the vessel is fishing in violation of these regulations.
- (3) Allowable fishing time. The Regional Director may revise allowable fishing times (hours per week, hours per month, or hours per quarter) to allow fishing for surf clams to be conducted throughout the entire year with the minimum number of changes to fishing times.

 - (i) Reduction. If, on review of the available information and public comment, including current and expected levels of fishing effort, the Regional Director determines during any quarter that the quarterly quota for surf clams [as adjusted under §652.21(a)(3)] probably will be exceeded, the Secretary may reduce the allowable fishing time.
 - (ii) Increase. If, on review of the available information and public comment, including current and expected levels of fishing effort, the Regional Director determines during any quarter that the quarterly quota of surf clams [as adjusted under §652.21(a)(3)] probably will not be harvested, and that the catch rate has not diminished as a result of a decline in abundance of stocks of surf clams, the Secretary may increase allowable fishing time to facilitate the harvest of the full quarterly quota.
- (4) Make-up periods. During November, December, January, February, March, and April, fishermen may claim a make-up period, if in the opinion of the vessel operator, weather or sea conditions would prevent effective fishing or endanger the vessel or crew.

 - (i) To claim the make-up period, the vessel owner or operator must contact the NMFS before the scheduled authorized fishing period starts. The Regional Director will notify each vessel owner or operator in writing as to the procedure to follow in contacting NMFS.
 - (ii) The make-up period will be equal in length to the scheduled authorized fishing period, and will begin 24 hours after the scheduled beginning of said period, except that if the make-up period could not then be completed before the end of the fishing week on Thursday at 1800 hours, then the make-up period begins on the following Sunday.
 - (iii) Before using this make-up provision, each vessel owner must notify the Regional Director, in writing, of the port from which the vessel fishes. If that port changes, the vessel owner must promptly notify the Regional Director of the change, in writing.
 - (iv) Any vessel which uses a make-up period without claiming it under this procedure, or which fishes under a scheduled authorized fishing period for which it has claimed a make-up period, is liable to forfeit its use of the make-up provision in the future; the vessel and its owner or

operator also may be subject to other penalties as prescribed in §652.9 of these regulations.

(b) Surf clams. New England Area.

- (1) Allowable fishing time. Fishing for surf clams will be allowed seven days per week.
- (2) Revisions. When 50 percent of the quota for surf clams established under §652.21(b) for the New England Area has been caught, the Regional Director will, on review of available information and public comment, determine whether the total catch of surf clams during the remainder of the year will exceed the annual quota. If the Regional Director determines that the quota probably will be exceeded, the Secretary may reduce the number of days per week, or establish authorized periods, during which fishing for surf clams is permitted.

(c) Ocean Quahogs.

- (1) Allowable fishing time. Fishing for ocean quahogs will be allowed seven days per week.
 - (2) Revisions. When 50 percent of the quota for ocean quahogs for any time period indicated in §652.21(c) above has been caught, the Regional Director will, on review of available information and public comment, 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 will be exceeded, the Secretary may reduce the number of days during which fishing for ocean quahogs is allowed.
- (d) Closures. If the Regional Director determines (based on logbook reports, processor reports, vessel inspections, or other information) that the quota for surf clams or ocean quahogs for any time period will be exceeded, the Secretary shall publish a notice in the Federal Register stating the determination and stating a date and time for closure of the fishery.
- (e) Notices. The Secretary will publish a notice in the Federal Register of any change in allowable fishing times. The Regional Director will send notice of any closure or any change in allowable fishing times to each surf clam or ocean quahog processor and to each surf clam or ocean quahog permit holder.
- (f) Presumption. The presence of surf clams or ocean quahogs aboard any vessel engaged in the surf clam or ocean quahog fishery, or the presence of any part of a vessel's gear in the water more than 12 hours after a closure occurs under this section, will be prima facie evidence that such surf clams or ocean quahogs were taken in violation of these regulations.

§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 by notice published by the Secretary, after a public hearing is held to discuss and assess the effects of such a closure. 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) Philadelphia and du Pont. A pair of areas used for disposal of chemicals and sewage sludge known as the "Philadelphia and du Pont closure" and located at 38° 23'15" N. latitude and 74° 14'45" W. longitude; and 38° 32'30" N. latitude and 74° 20'00" W. longitude with a radius of four and three-quarters nautical miles in every direction from those two points.
- (4) 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 1/2 inches in size, and;
 - (ii) Not more than 15 percent are larger than 5 1/2 inches in size. (Sizes are measured at the longest dimension of the surf clam.)
- (2) Reopening. The Secretary may reopen areas or parts of areas closed under paragraph (b)(1) 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 5 1/2 inches or more; 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.
- (3) Control of reopened areas. The Secretary will control the harvest of surf clams from reopened areas separate from the management of the general fishery until the catch per unit of effort in the reopened area is comparable to the average catch per unit of effort in the general fishery, at which time the reopened area will become part of the general fishery. Any of the following mechanisms may be used to control harvests from reopened areas:
- (i) The Regional Director may request that vessel operators announce their intent to fish within reopened areas.
 - (ii) The Regional Director may, based on reference to survey information, select an appropriate range of allowable fishing time for the reopened area to achieve parity with fishing practices in the general fishery. The range will be published for notice and comment subject to the procedures established in paragraph (c) of this section. The Regional Director may subsequently adjust fishing time within the range, based on logbook information, to maintain parity with the general fishery. These adjustments will be published by notice in accordance with paragraph (c) of this section.
 - (iii) The Regional Director may set a schedule for vessels to operate in reopened areas if he determines that the number of vessels planning to operate simultaneously in a reopened area exceeds the number which can safely be accommodated in the area, or which can effectively be monitored by enforcement officers.
 - (iv) If the Regional Director determines, based on resource survey information, that the yield of surf clams in a reopened area will be enhanced by selective thinning of the surf clam population in the area, he may temporarily suspend the surf clam size limit in that area. Areas of this type will be identified and defined in accordance with the notice and comment procedures established in paragraph (c) of this section.
- (c) Procedures. The Regional Director may hold a public hearing on the proposed closure or reopening of

any area under paragraphs (a) or (b) of 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.

- (d) Presumption. The presence of surf clams or ocean quahogs aboard any fishing vessel, or the presence of any part of the vessel's gear in the water, in closed areas is prima facie evidence that such clams or quahogs were taken in violation of these regulations.

§652.24. Vessel moratorium.

The moratorium that became effective on November 17, 1977, prohibiting the entry of additional vessels into the surf clam fishery, shall remain in effect in the Mid-Atlantic Area until replaced by a revised limited-entry system.

§652.25 Size restriction.

- (a) Minimum length. A minimum size limit for surf clams of 5 1/2 inches in length is imposed on the Mid-Atlantic Area fishery with the following exceptions:

- (1) Ten percent of all full cages in possession, to the nearest whole cage (or at least one cage), can be withheld by the operator from inspection by an authorized officer; and
- (2) As many as 240 surf clams in any full cage inspected by the authorized officer may be less than 5 1/2 inches in length. If any inspected cage is found to be in violation, all cages in possession and not withheld subject to paragraph (a)(1) of this section will be deemed in violation of the size limit.

- (b) Measurement. Length is measured at the longest dimension of the surf clam.