

**ENVIRONMENTAL ASSESSMENT and
ESSENTIAL FISH HABITAT ASSESSMENT
for the 2001 SURFCLAM and OCEAN
QUAHOG FISHING QUOTAS**

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I. INTRODUCTION

This environmental assessment is undertaken to establish quotas for the 2001 Atlantic surfclam and ocean quahog fisheries. Biological assessments of these resources are conducted by the National Marine Fisheries Service (NMFS) Northeast Region's Stock Assessment Workshop (SAW), which evaluates biological parameters such as overall population size, geographic distribution, age structure, and mortality rates from both natural causes and fishing activities. The most recent complete assessment was published in the Report of the 30th Northeast Regional Stock Assessment Workshop (USDC 2000a) for surfclams and the 31st Northeast Regional Stock Assessment Workshop (USDC 2000b) for ocean quahogs. These two assessments are based on the 1999 clam research survey. Copies of the 2000 assessments are available both from the National Marine Fisheries Service in Woods Hole, MA, and the Mid-Atlantic Fishery Management Council (Council).

II. PURPOSE AND NEED FOR ACTION

The purpose for the action is to establish landing quotas for 2001 for both surfclams and ocean quahogs. Regulations implementing the FMP (50 CFR 648) provide that the Secretary of Commerce (Secretary) will annually specify the quotas. The quota range for surfclams is between 1,850,000 bushels and 3,400,000 bushels. The quota range for ocean quahogs is between 4,000,000 bushels and 6,000,000 bushels. The quota range for the Maine ocean quahog area (both state and federal waters off the eastern coast of Maine north of 43° 50' north latitude) is between 17,000 and 100,000 bushels.

Prior to the beginning of each year, the Council, following an opportunity for public comment, recommends to the Secretary quotas within the ranges specified. In selecting the quotas the Council must consider current stock assessments, catch reports, and other relevant information concerning: exploitable and spawning biomass relative to the optimum yield; fishing mortality rates relative to the optimum yield; magnitude of incoming recruitment; projected effort and corresponding catches; geographical distribution of the catch relative to the geographical distribution of the resource; and status of areas previously closed to surfclam or ocean quahog fishing that are to be opened during the year and areas likely to be closed to fishing during the year.

The Council clarified its quota setting policies for surfclams and ocean quahogs at the April 1998 Council meeting, due to the ambiguity which some individuals associated with the word "demand." The revised Council policies for surfclams and ocean quahogs are:

Council policy is to set the surfclam quota within the OY range (1,850,000 to 3,400,000 bushels) at a level that will allow fishing to continue at that level for at least 10 years, and within the above constraints the quota may be set taking into account economic information to set the quota to consider net economic benefits over time to consumers and producers, within the framework of greatest national benefit.

Council policy is to set the ocean quahog quota within the OY range (4,000,000 to 6,000,000 bushels)

at a level that will allow fishing to continue at that level for at least 30 years, and within the above constraints the quota may be set taking into account economic information to set the quota to consider net economic benefits over time to consumers and producers, within the framework of greatest national benefit.

At the March 2000 Council meeting, the Council (after reviewing the 2000 surfclam assessment, USDC 2000a) passed a motion that, “given the recent stock assessment, we consider an increase in quota to the 3.4 million bushel OY over the next 5 years with a 10% increase the first year.”

The quota is set at that amount which is most consistent with the objectives of the Fishery Management Plan for the Atlantic Surfclam and Ocean Quahog Fishery (MAFMC 1990). The Secretary may set quotas at quantities different from the Council's recommendations only if he can demonstrate that the Council's recommendations violate the National Standards of the Magnuson Act and the objectives of the Atlantic Surfclam and Ocean Quahog Fishery Management Plan.

The following table presents surfclam and ocean quahog quotas since 1990 and the year 2001 recommendation voted by the Mid-Atlantic Council in August 2000:

	Surfclams <u>(million bushels)</u>	Ocean Quahogs <u>(million bushels)</u>
1990 Quota	2.850	5.300
1991 Quota	2.850	5.300
1992 Quota	2.850	5.300
1993 Quota	2.850	5.400
1994 Quota	2.850	5.400
1995 Quota	2.565	4.900
1996 Quota	2.565	4.450
1997 Quota	2.565	4.317
1998 Quota	2.565	4.000
1999 Quota	2.565	4.500
2000 Quota	2.565	4.500
2001 Recommendation	2.850	4.500

III. MANAGEMENT OBJECTIVES

The objectives of the FMP, since implementation of Amendment 8 (MAFMC 1990), have been and continue to be:

1. Conserve and rebuild Atlantic surfclam and ocean quahog resources by stabilizing annual harvest rates throughout the management unit in a way that minimizes short term economic dislocations.
2. Simplify to the maximum extent the regulatory requirement of surfclam and ocean quahog management to minimize the government and private cost of administering and complying with regulatory, reporting, enforcement, and research requirements of surfclam and ocean quahog management.

3. Provide the opportunity for industry to operate efficiently, consistent with the conservation of surfclam and ocean quahog resources, which will bring harvesting capacity in balance with processing and biological capacity and allow industry participants to achieve economic efficiency including efficient utilization of capital resources by the industry.

4. Provide a management regime and regulatory framework which is flexible and adaptive to unanticipated short term events or circumstances and consistent with overall plan objectives and long term industry planning and investment needs.

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

IV. AFFECTED ENVIRONMENT OF THE SURFCLAM RESOURCE

The 1997 and 1999 NEFSC clam surveys and subsequent assessments of surfclams (USDC 1998a and 2000a) and ocean quahogs (USDC 1998b and 2000b) marked a substantial increase in the efforts made to understand the dynamics and quantify the status of the surfclam and ocean quahog resources off the northeastern United States. Industry vessels donated their time in conducting depletion experiments alongside a NMFS research vessel, which served to improve the accuracy of several parameters used in assessment models. Numerous NMFS scientists, other governmental scientists, academics, and industry representatives all significantly contributed to the better and more thorough understanding of the surfclam and ocean quahog resources over the past four years.

Key findings from the 30th SARC Advisory Report (USDC 2000a) included the following:

- Ž The EEZ surfclam resource is at a high level of biomass and is under-exploited.
- Ž The majority of the catch is derived from the Northern New Jersey (NNJ) area which contains about 39% of the coast-wide resource. Large fractions of the resource are exploited at low levels (Delmarva containing 25% of the resource) or not at all (Georges Bank containing 21% of the resource).
- Ž Estimated mean annual fishing mortality rates from 1997-1999 were 0.02 for the entire EEZ resource, 0.03 - 0.04 for the NNJ region, and 0.04 - 0.07 for the SNJ region.
- Ž Age composition data from the 1997 survey for NNJ and Delmarva indicate that the populations contain at least 18 cohorts, none of which are dominant. The length frequencies for these two regions between the 1997 and 1999 surveys did not significantly vary.
- Ž Fishing mortality can be increased for the surfclam resource taken as a whole. However, it may be advantageous to avoid localized depletion.

It should be noted that the surfclam and ocean quahog resources on Georges Bank remain closed to fishing due to the presence of Paralytic Shellfish Poisoning toxin.

Key findings of the Quota Recommendations paper (MAFMC 2000a) indicate:

- Ž Underutilization of the surfclam resource due to soft market conditions eased in 1999. For the first time since 1996, virtually all of the quotas for the federal and New Jersey inshore fisheries were harvested.
- Ž Development of a new, high-quality "super-strip" product by industry has played an important role in reviving demand for surfclam products. First introduced into New England markets, acceptance has spread to the restaurant trade in New York and New Jersey.
- Ž In part to meet the requirements of new premium strip products, current estimates indicate that approximately 25% of the surfclam harvest is now being shucked by hand.
- Ž Exvessel prices edged only slightly lower in 1999 after falling sharply the year before. Median exvessel price is now \$10.00 per bushel.
- Ž Coastwide landings of surfclams increased 9.7% to 3.5 million bushels, with reported values increasing 5% to \$30.4 million in 1999.
- Ž A fleet-wide calculation of Landings Per Unit of Effort (LPUE) showed that the industry average increased approximately 12% to 127 bushels per hour in 1999.
- Ž Harvests continue to be concentrated off the coast of New Jersey, with 62% of the catch coming from the "New Jersey Nearshore" (3973) degree square. Average LPUE for this square increased 15% for Class 3 vessels in 1999, though it is still down substantially from catch rates attained in the late 1980's.

V. ALTERNATIVES BEING CONSIDERED FOR SURFCLAM QUOTA

VI.1. Preferred Alternative - 2.85 Million Bushel Quota for Surfclams

VI.2. Alternative 1 - 2.365 Million Bushel Quota for Surfclams

VI.3. Alternative 2 - 2.565 Million Bushel Quota for Surfclams (status quo)

VI.4. Alternative 3 - 3.4 Million Bushel Quota for Surfclams

VI.5. Alternative 4 - 1.85 Million Bushel Quota for Surfclams

VI.6. Other Management Actions: Suspend Minimum Size Restriction on Surfclams for 2001

VI. ENVIRONMENTAL CONSEQUENCES OF PREFERRED AND OTHER ALTERNATIVES

The analysis of economic impacts contained in the RIR is incorporated by reference to supplement the economic analysis provided here. The social impacts of each alternative are expected to vary in accordance with the economic impacts of each one.

VI.1. Preferred Alternative - 2.85 Million Bushel Quota for Surfclams

The Council's preferred alternative quota for the 2001 surfclam fishery is 2.85 million bushels, which is an 11% increase from the 2000 quota of 2.565 million bushels and a return to the level of harvest that was in place during the first five years of the ITQ program (1990 through 1994). This preferred alternative meets the 2000 SAW recommendation "Fishing mortality can be increased for the surfclam resource taken as a whole. However, it may be advantageous to avoid localized depletion."

The most recent biological assessments (from both the 1997 and 1999 surveys) indicate the resource is healthy, composed of many age classes, and can safely sustain increased harvests. Sufficient recruitment is also evident and thus this level of quota will not harm the long-term sustainability of the resource. The F in 1999 associated with a quota of 2.565 million bushels was approximately 0.02 and this slight quota increase may increase the F in 2001 to at most 0.03.

The proposed quota takes into account analysis of surfclam abundance that was part of the 30th Northeast Regional Stock Assessment Workshop (SAW 30). SAW 30 utilized data from the 1999 surfclam survey, which included work to estimate dredge efficiency. Results from the 1999 survey and assessment corroborate those of the 1997 survey and assessment and provided the Council the opportunity to safely increase the quota. The Council has tentatively agreed with industry's request to continue increasing incrementally the quota during the next five years up to the maximum optimum yield (3.4 million bushels) level. The Council will continue to perform its annual review of the fishery, but wanted industry to understand that should future assessments continue to indicate the healthy status of the resource that the industry can plan for steady growth to its maximum level.

The Council continues to assume that none of the Georges Bank resource (approximately twenty percent of the total resource) will be available in the near future for harvesting because of paralytic shellfish poisoning. This area has been closed to the harvest of clams and other shellfish since 1989, and the Council and NMFS have no reason to believe that it will reopen in the near future.

The Sustainable Fisheries Act (SFA) of 1996 significantly altered the requirement of FMPs to address habitat issues. The SFA contains provisions for the identification and protection of habitat essential to the production of federally managed species. The Act requires FMPs to include identification and description of essential fish habitat (EFH), description of non-fishing and fishing threats, and to suggest conservation and enhancement measures. These new habitat requirements, including what little is known about clam gear impacts to the bottom, are addressed in Amendment 12 (MAFMC 1999).

Since there would be only a minor change in the quota from what it was between 1995 and 2000 while it returns to the levels of what it was between 1990 and 1994, impacts on bottom habitat would be minor. This slightly increased quota may have no effect on the exvessel market for surfclams, *ceteris paribus*. However, given the current increased demand for surfclams in the market, it is probable that the exvessel price of surfclams will remain steady (MAFMC 2000b).

VI.2. Alternative 1 - 2.365 Million Bushel Quota for Surfclams

The first non-preferred alternative quota for the 2000 surfclam fishery is 2.365 million bushels. This quota is within the OY range of between 1.850 and 3.400 million bushels as required by the FMP. This alternative would reduce the surfclam quota by 8% from 2000 in an attempt to match the harvest level reached in 1998

(MAFMC 2000a).

The 2.365 million bushel recommendation for 2001 represents a decrease of 8% from the 2.565 million bushel quota which has been in effect since 1995. The direct impact would be that surfclam allocation owners would each receive 8% fewer cage tags than they had the year before. All allocation owners would be affected proportionally the same, since the harvest right which each individual entity owns is actually a percentage share of the annual quota. If all other aspects of the surfclam fishery were to remain constant, such as ex-vessel prices and the quantity of surfclams supplied from state waters, then the major human consequence of the quota reduction is the near-term decrease in revenues which occurs from postponing a portion of the harvest of surfclams to a later year. It is unlikely, however that all the other conditions which held true in 1998 will pertain again in 2001.

The major reason the Council may have considered reducing the 2001 quota from the 2000 quota was in order to comply with Council policy about setting the quota to consider net economic benefits over time to consumers and producers, within the framework of greatest national benefit. Landings relative to quota (and showing significant amounts unused) for inshore New York and New Jersey were presented in the Quota Recommendation paper (MAFMC 2000a). A segment of industry in previous years has presented their surfclam market analyses, and argued that a decline in consumer demand for surfclam products had led to an increase in inventories, and brought harm to a portion of the industry which had experienced great difficulty in finding market for their surfclams. However, this is currently not the case.

In 1999, 99% of the EEZ quota was landed. Prior to 1997 the previous five years of the ITQ program landed between 99 and 100% of the quota annually, but between 1997 and 1998 more than 5% of the quota was not landed. With the EEZ quota at a constant 2.565 million bushels for each of those years, it is believed that market forces were the primary reason behind the EEZ landing decline. Also contributing to the conclusion for 1997 and 1998, that market demand was off was the fact that inshore New York and New Jersey landings were significantly below their quotas, however landings in New Jersey increased significantly in 1999 (MAFMC 2000a).

An 8% reduction in quota for 2001 could possibly benefit the long-term sustainability of the resource, however there is the offsetting argument that the slow growing clams off of Delmarva may need to be thinned in order to be more productive. (The 1998 assessment (USDC 1998a) states: "It is unclear to what degree this is due to density dependence or environmental effects. Therefore, it is unclear whether reducing the density through fishing would improve growth and condition.") The annual impacts on bottom habitat may be slightly lessened with a reduction in quota. This level of quota would likely increase exvessel prices, *ceteris paribus* (MAFMC 2000b).

VI.3. Alternative 2 - 2.565 Million Bushel Quota for Surfclams

The second non-preferred alternative quota for the 2001 surfclam fishery is the status quo of 2.565 million bushels. This quota is within the OY range of between 1.850 and 3.400 million bushels as required by the FMP. This alternative would maintain the surfclam quota at the level it has been for the past five years (MAFMC 2000a).

The 2.565 million bushel recommendation for 2001 represents the status quo. The direct impact would be that

surfclam allocation owners would continue to each receive the same number of cage tags they had the year before. All allocation owners would be affected proportionally the same, since the harvest right which each individual entity owns is actually a percentage share of the annual quota. If all other aspects of the surfclam fishery were to remain constant, such as ex-vessel prices and the quantity of surfclams supplied from state waters, then there would be no major human consequence of the status quo. It is unlikely, however that all the other conditions which held true in 2000 will pertain again in 2001.

The major reason the Council considered the status quo for the 2001 quota from the 2000 quota was in order to comply with Council policy about setting the quota to consider net economic benefits over time to consumers and producers, within the framework of greatest national benefit. Landings relative to quota (and showing significant amounts unused) for inshore New York were presented in the Quota Recommendation paper (MAFMC 2000a).

However, in 1999, 99% of the EEZ quota was landed. Prior to 1997 the previous five years of the ITQ program landed between 99 and 100% of the quota annually, but between 1997 and 1998 more than 5% of the quota was not landed. With the EEZ quota at a constant 2.565 million bushels for each of those years, it is believed that market forces were the primary reason behind the EEZ landing decline. Also contributing to the conclusion that market demand was off was the fact that inshore New York and New Jersey landings were significantly below their quotas, however landings in New Jersey increased significantly in 1999 (MAFMC 2000a).

Maintaining the status quo quota for 2001 could possibly affect the long-term growth of the industry, if industry is correct and the demand is growing. There is the argument that the slow growing clams off of Delmarva may need to be thinned in order to be more productive or may never become more productive. (The assessment (USDC 1998a) states: "It is unclear to what degree this is due to density dependence or environmental effects. Therefore, it is unclear whether reducing the density through fishing would improve growth and condition.") The annual impacts on bottom habitat would be the same with maintaining the quota. This level of quota would maintain exvessel prices, *ceteris paribus* (MAFMC 2000b).

VI.4. Alternative 3 - 3.4 Million Bushel Quota for Surfclams

The maximum quota allowed under the FMP is 3.4 million bushels. This level of quota may require that the risk of paralytic shellfish poisoning from surfclams harvested on Georges Bank would be mitigated by employment of a dockside test for the toxin. The Council assumed none of the surfclam resource on Georges Bank would be available over the next ten years, and thus this quota could be viewed as excessive and risky. Given the current condition of the resource this level of quota could adversely affect the long-term sustainability of the stock since the PSP problem has not been resolved and this large amount of quota for surfclams would be harvested from already heavily fished areas. Increased pressure on bottom habitat could also possibly cause adverse effects. This level of quota would place a downward pressure on exvessel price, *ceteris paribus*.

VI.5. Alternative 4 - 1.85 Million Bushel Quota for Surfclams

Discounting the availability of the resource on Georges Bank there is sufficient resource in the Northern New Jersey and Delmarva areas to maintain a quota significantly above this level. The biology of the resource does not warrant constraining the industry to this level at this time. This level of quota may not have significantly

different effects on the resource (since more may die of natural mortality), but may have a somewhat more beneficial effect on bottom habitat than the preferred alternative, since there would be less fishing effort. This level of quota would likely increase exvessel prices, *ceteris paribus*.

VI.6. Other Management Actions: Suspend Minimum Size Restriction on Surfclams for 2001

The Surfclam and Ocean Quahog FMP includes a provision for a minimum size limit of 4.75 inches on surfclams, which may be used to protect new year classes from harvest before they have reached an optimal size. The provision is written such that a minimum size will automatically be in effect unless the Council takes the active step of suspending it each year.

The current stock is comprised primarily of large, adult individuals, with few small individuals apparent from landings in most areas (USDC 2000a). Reinstating a minimum size under these conditions would result in greater harm than benefit, as it would require the industry to use "sorting" machines which will often damage undersized clams as it routes them back overboard.

It is, therefore, the Council's recommendation that the surfclam minimum size limit be suspended for 2001, as has been done every year since 1990. Continuing the suspension will have no impact on the current fishery.

VII. AFFECTED ENVIRONMENT OF THE OCEAN QUAHOG RESOURCE

The 1997 and 1999 NEFSC clam survey and subsequent assessments of surfclams (USDC 1998a and 2000a) and ocean quahogs (USDC 1998b and 2000b) marked a substantial increase in the efforts made to understand the dynamics and quantify the status of the surfclam and ocean quahog resources off the northeastern United States. Industry vessels donated their time in conducting depletion experiments alongside a NMFS research vessel, which served to improve the accuracy of several parameters used in assessment models. Numerous NMFS scientists, other governmental scientists, academics, and industry representatives all significantly contributed to the better and more thorough understanding of the surfclam and ocean quahog resources over the past four years.

Key findings from the 31st SARC Advisory Report (USDC 2000b) included the following:

- Ž The ocean quahog resource in surveyed EEZ waters from Southern New England (SNE) to southern Virginia (SVA) is not overfished and overfishing is not occurring.
- Ž The current biomass is high with current catches near MSY.
- Ž Fully 36% of the current biomass is in the unfishable region of Georges Bank.
- Ž Annual recruitment is approximately 1 - 2% of stock biomass and lower than, or roughly equal to, the rate of natural mortality.
- Ž The percentage of virgin biomass in the assessed areas (not including Georges Bank because of PSP unavailability) is 82%.

- Ž The stock off the coast of Maine continues to be harvested, but the condition of the resource there is unknown.
- Ž Current fishing mortality is near F_{target} for the resource taken as a whole. However, it may be advantageous to avoid localized depletion.

Key findings of the Quota Recommendations paper (MAFMC 2000a) indicate:

- Ž Of greatest significance is the fact that fully 16% of the 1999 federal ocean quahog quota was left unharvested in the ocean. In 1996 and 1997 the quota had been binding on the industry, so the Mid-Atlantic Council recommended the quota be raised from 4.0 to 4.5 million bushels in 1999. None of this increase was tapped by the industry, and one can observe that landings have actually been on a declining trend from the 4.9 million bushel peak in 1992.
- Ž A fleet-wide calculation of Landings Per Unit of Effort showed that the average yield continued its recent steady decline by 3.3% in 1999, from 123 to 119 bushels per hour of fishing.
- Ž Exvessel prices have remained largely unchanged from 1997 through 1999, with more than three quarters of the trips reporting the sale of their catch at \$4.25 per bushel.
- Ž Harvests of ocean quahogs continue to be distributed over a larger geographic area than surfclams, although over one-third of the 1999 catch came from one degree square off of eastern Long Island.
- Ž Limits on the continued movement of the fleet eastward are still impeded by the closure of surfclam and ocean quahog beds east of the 69^o line, due to the presence of PSP toxin.
- Ž Since the fishery began in the late 1970's, the massive ocean quahog "population centers" along the East Coast have systematically been fished down. Diminishing catch rates combined with long travel distances to offshore beds have made ocean quahogs more costly to harvest. With exvessel prices failing to keep pace with the heightened costs, the industry has increasingly been substituting surfclams for ocean quahog sales.
- Ž Difficulties experienced by the ocean quahog portion of the fishery are also reflected in vessel participation rates. While the total number of vessels in the federal surfclam and ocean quahog fleet declined 16% from 1996 to 1998 (from 56 to 47 vessels), that portion which participates in the harvest of ocean quahogs dropped by fully one-third over the same interval (from 36 to 24 vessels). Vessel owners have reported difficulty keeping crews on ocean quahog vessels.
- Ž The concern for the ocean quahog fishery is economic, not biological. Its vast size and very slow rate of replacement can be likened to a large oil field, where most of the easy extractions have been made. Large deposits of oil may remain, but when the rate of production falls below an economic threshold, a well will be capped and the rigs will move elsewhere. Improvements in technology and increases in price can lower the threshold and make sparser resources viable again. However the risk that these factors will not improve sufficiently over a 10 to 20 year time horizon are real, and must be taken into consideration when

annual quotas are set that are intended to sustain the resource and a fishery.

VIII. ALTERNATIVES BEING CONSIDERED

IX.1. Preferred Alternative - 4.5 Million Bushel Quota for Ocean Quahogs (status quo)

IX.2. Alternative 1 - 4.0 Million Bushel Quota for Ocean Quahogs

IX.3. Alternative 2 - 4.25 Million Bushel Quota for Ocean Quahogs

IX.4. Alternative 3 - 4.75 Million Bushel Quota for Ocean Quahogs

IX.5. Alternative 4 - 6 Million Bushel Quota for Ocean Quahogs

IX.6. Other Management Actions: Quota for the Maine Ocean Quahog Fishery

IX. ENVIRONMENTAL CONSEQUENCES OF PREFERRED AND OTHER ALTERNATIVES

The analysis of economic impacts contained in the RIR is incorporated by reference to supplement the economic analysis provided here. The social impacts of each alternative are expected to vary in accordance with the economic impacts of each one.

IX.1. Preferred Alternative - 4.5 Million Bushel Quota for Ocean Quahogs

The Council proposes a 2001 ocean quahog quota of 4.5 million bushels, the same as 1999 and 2000. There is no biological reason that the resource can not support this level of quota given the most recent stock assessments (USDC 1998b and 2000b). The 1997 (4.317 million bushels) and 1998 (4 million bushels) reductions were based on evaluation of the harvest level which would satisfy the Council policy of a harvest level which could be maintained for at least 30 years given the information prior to the 1998 assessment (USDC 1998b). The 1997 quota recommendation assumed that all of the Georges Bank biomass would become available to the fishery over the course of the 30 year harvest period. In making that assumption, however, the Council stated that additional quota reductions would be necessary in the future if demonstrable progress was not made toward a reopening of Georges Bank in the near future. The 1996 SAW did not provide any forecast for ocean quahogs and only provided the management advice that a 30-year supply is possible only if the biomass on Georges Bank and in areas off Southern New England and Long Island, generally too deep to be harvested with current technology, were included.

The Sustainable Fisheries Act (SFA) of 1996 significantly altered the requirement of FMPs to address habitat issues. The SFA contains provisions for the identification and protection of habitat essential to the production of federally managed species. The Act requires FMPs to include identification and description of essential fish habitat (EFH), description of non-fishing and fishing threats, and suggest conservation and enhancement measures. These new habitat requirements, including what little is known about clam gear impacts to the bottom, are addressed in Amendment 12 (MAFMC 1999). The effect on bottom habitat of the 4.5 million bushel quota would be the same as is currently occurring with the 4.5 million bushel quota. This level of quota will not effect the exvessel market, *ceteris paribus*.

Based on the biological data presented in the most recent assessments (USDC 1998b and 2000b) the ocean

quahog quota could have been increased overall. The Council proposed a 2001 ocean quahog quota based on the analysis of abundance for that species found in the 31st Northeast Regional Stock Assessment Workshop (SAW 31) concluded in August 2000. Similar to surfclams, SAW 31 and the assessment from the 1997 survey (SAW 27) included work to estimate dredge efficiency and showed a significant increase in the estimate of ocean quahog biomass. Although 36 percent of the resource is located on Georges Bank, SAW 31 did not question whether Georges Bank would ever be reopened. The resource is of sufficient size overall that the proportion of ocean quahogs that exists on Georges Bank is not necessary to meet the Council's 30-year supply policy. It is estimated the even excluding the ocean quahog resource portion on Georges Bank, that fully 82% of the virgin biomass remains after two decades of harvesting these long-lived creatures.

Although SAW 31 showed that the ocean quahog quota could have been increased beyond the 2000 quota level, the Council did not recommend any change for 2001 because of four major factors: (1) the 1999 quota was not constraining to industry; (2) nearly all industry members supported the 4.5 million bushel harvest level; (3) repeated concern was expressed by industry over the continued lack of apparent ocean quahog recruitment south of Georges Bank; and (4) unless prices or technology changes significantly in the near future, it is unlikely that the ocean quahog fishery extractions in the past are sustainable because those extractions have been dependent on rich virgin beds.

The Secretary approved Amendment 12 (MAFMC 1999) with its new overfishing definition in April 1999. The new definition has: a "biomass target" = $\frac{1}{2}$ virgin biomass, "fishing mortality target" = $F_{0.1}$, "biomass threshold" = $\frac{1}{2}$ biomass target, and a "fishing mortality threshold" = to $F_{25\%}$ MSP level yielding $F = 0.04$. The 1999 quota yielded an F of approximately 0.02 compared to the threshold of 0.04 contained in the overfishing definition. The specific F associated with the 2001 quota is expected to be close to the F in 1999, because a similar proportion of the biomass remains unexploited compared to 1999. Therefore, the proposed quota is below the approved overfishing definition for fishing mortality.

The 4.5 million bushel recommendation for 2001 is the same as the 1999 and 2000 level, but represented an increase of 13% from the 4 million bushel quota of 1998. If accepted by the National Marine Fisheries Service (NMFS), the direct impact would be a maintenance of the status quo allocation issued to each allocation owner for 2000. There should be no change in economic impacts since the status quo is maintained.

Maintaining the ocean quahog quota at the 4.5 million bushel level relaxes the binding constraint which existed on the ocean quahog supply for 1997 and 1998 and places it at a level which industry members have stated will meet their needs. Given the reassuring news resulting from the latest stock assessments, many would find it unreasonable to restrain the supply of ocean quahogs at a time when the industry has a market for them, and both harvesting and processing capacity are not being fully utilized (MAFMC 2000b).

IX.2. Alternative 1 - 4.0 Million Bushel Quota for Ocean Quahogs

The minimum quota allowed under the OY definition is the alternative for 4 million bushels, which was not chosen by the Council because it may be constraining to industry and there is no biological reason to constrain industry at this point. The 4 million bushel level is the level the Council selected in 1998 and was a reduction of 7.3 percent from 1997. With the 1997 and 1999 surveys and the 1998 and 2000 assessments showing that there is sufficient resource, the Council elected to have a slight increase for 1999 and maintain that level for 2000 and 2001 in order to allow the industry to slightly grow.

The quota reductions which the Council recommended in 1997 and 1998 were in part due to questions about the validity of assuming that all of the Georges Bank biomass would become available to the fishery over the course of the 30 year harvest period. In 1996 when the Council made the assumption of a reopening occurring on Georges Bank, the Council stated that additional quota reductions would be necessary in the future if demonstrable progress was not made toward a reopening of Georges Bank in the near future. The 1996 SAW did not provide any forecast for ocean quahogs and only provided the management advice that a 30 - year supply is possible only if the biomass on Georges Bank and in areas off Southern New England and Long Island, generally too deep to be harvested with current technology, were included.

The 1998 and 2000 SAWs (USDC 1998b and 2000b) did not question whether Georges Bank would ever be opened. Fully more than a third of the resource is located on Georges Bank. The resource is of sufficient size overall that the third that is on Georges Bank is not necessary to meet the Council's 30 supply year policy.

As with the surfclam resource, the vast majority of ocean quahogs which are left unharvested in 2001 will still be available to the same allocation holders in subsequent years. Earnings are simply deferred rather than lost, with the ocean quahogs being stored in the ocean rather than in refrigerated containers or cans.

This level of quota may have a slight beneficial effect on the resource since major recruitment incidents have not been identified for the ocean quahog stock, and these animals may take up to 20 years to reach marketable size depending upon environmental conditions. A return to the 1998 quota level may have a slightly higher beneficial effect on the bottom habitat since less bottom would be exposed to the hydraulic dredging, especially in areas that have been heavily fished. This level of quota will not likely effect the exvessel market, *ceteris paribus*.

IX.3. Alternative 2 - 4.25 Million Bushel Quota for Ocean Quahogs

Splitting the difference between the minimum allowable quota under the OY range and the current quota of 4.5 million bushels, yields a quota of 4.25 million bushels. This is a partial reduction of 6%. This level was not chosen by the Council because it could be constraining to industry and there is no biological reason to constrain industry at this point. With the 1997 and 1999 surveys and 1998 and 2000 assessments showing that there is sufficient resource, the Council elected to have a slight increase for 1999, and maintain that level for 2000 and 2001, in order to allow the industry to slightly grow.

The quota reductions which the Council recommended in 1997 and 1998 were in part due to questions about the validity of assuming that all of the Georges Bank biomass would become available to the fishery over the course of the 30 year harvest period. In 1996 when the Council made the assumption of a reopening occurring on Georges Bank, the Council stated that additional quota reductions would be necessary in the future if demonstrable progress was not made toward a reopening of Georges Bank in the near future. The 1996 SAW did not provide any forecast for ocean quahogs and only provided the management advice that a 30 - year supply is possible only if the biomass on Georges Bank and in areas off Southern New England and Long Island, generally too deep to be harvested with current technology, are included.

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This level of quota may have a slight beneficial effect on the resource since major recruitment incidents have not been identified for the ocean quahog stock, and these animals may take up to 20 years to reach marketable size depending upon environmental conditions. A return to a level near the 1997 quota level may have a slightly higher beneficial effect on the bottom habitat since less bottom would be exposed to the hydraulic dredging, especially in areas that have been heavily fished. This level of quota will not likely effect the exvessel market, *ceteris paribus*.

IX.4. Alternative 3 - 4.75 Million Bushel Quota for Ocean Quahogs

This is a 6% increase over the current quota and near the mid-point of the OY range for ocean quahog quotas. An increase in quota of this amount was favored by a few processors in the industry but as a whole industry was willing to maintain the status quo. Bottom habitat may be slightly negatively impacted as more ocean quahogs would be removed. Exvessel prices would likely fall as supply would probably exceed demand. For 1999, industry requested the Council raise the quota to 4.5 million bushels as that is what they expect to be able to sell in 1999 and, in general, they supported maintaining the status quo for 2000 and 2001.

IX.5. Alternative 4 - 6 Million Bushel Quota for Ocean Quahogs

This is the maximum of the OY range for ocean quahog quotas and would be a quota increase of 33% above the status quo. A quota this high may not meet the Council's policy of providing at least a 30-year ocean quahog supply. Bottom habitat would likely be negatively impacted as roughly 33% more ocean quahogs would be removed. Exvessel prices likely would fall as supply would greatly exceed demand. For 1999, industry requested the Council raise the quota to 4.5 million bushels as that is what they expect to be able to sell in 1999 and they supported maintaining the status quo for 2000 and 2001.

IX.6. Other Management Actions: Quota for the Maine Ocean Quahog Fishery

The Council voted to recommend that the Maine ocean quahog quota remain unchanged for 2001 at the initial maximum quota level of 100,000 bushels. This quota pertains to the zone of both state and federal waters off the eastern coast of Maine north of 43 degrees 50 minutes north latitude. Amendment 10 (MAFMC 1998) which established management measures for this small artisanal fishery for ocean quahogs was implemented in May of 1998. Data from the federally managed fishery is being compiled and there has been no attempt yet to develop and conduct a scientific survey of the extent of the resource. There are other quota alternatives that could be considered, and in fact the RIR (section 7.2.3, MAFMC 2000b) evaluates a quota reduction of 50% and a quota fixed at the 1998 harvest level of 72,466 bushels. However, it is important to understand that any shortfall that a restrictive Maine ocean quahog fishery quota imposes can be made up with quota rented or bought from ITQ holders. As such, the only impacts of different quotas in this fishery would be economic (rental or purchase price of ITQs) and not biological.

The Council believes that the 2000 quota will likely be reached in the fall and the Regional Administrator will

close the fishery in 2000. It is anticipated that the Regional Administrator will likely also have to close the fishery in 2001.

According to 50 CFR section 648.76 (2)(b)(iv): *The Regional Administrator will monitor the quota based on dealer reports and other available information and shall determine the date when the quota will be harvested. NMFS shall publish notification in the Federal Register advising the public that, effective upon a specific date, the Maine mahogany quahog quota has been harvested and notifying vessel and dealer permit holders that no Maine mahogany quahog quota is available for the remainder of the year.*

It must also be remembered that according to 50 CFR section 648.76 (2)(b)(iii): *All mahogany quahogs landed by vessels fishing in the Maine mahogany quahog zone for an individual allocation of quahogs under section 648,70 will be counted against the ocean quahog allocation for which the vessel is fishing.* In other words, even after the initial maximum quota of 100,000 Maine bushels is harvested from the Maine mahogany ocean quahog zone (north of 43°50'), vessels could obtain/use ITQ allocation and continue to fish in this zone. It is anticipated that some Maine fishermen will rent ITQ allocation after the 100,000 bushel quota is reached.

Amendment 10 (MAFMC 1998) emphasized that there had been no comprehensive, systematic survey or assessment of the ocean quahog resource in eastern Maine. It also emphasized that a full stock assessment of the Maine resource should be a priority to ensure that this segment of the fishery would have a sustainable future. The initial maximum quota for the Maine zone was to remain in effect until a resource survey and assessment was completed. The agreement at the time of Amendment 10 was that the State of Maine was to initiate a survey once the initial maximum quota of 100,000 bushels became constraining. Such a survey has not yet been conducted.

X. IMPACTS ON ENDANGERED SPECIES AND MARINE MAMMALS

Numerous species of marine mammals and sea turtles occur in the northwest Atlantic Ocean. The most comprehensive survey in this region was done from 1979-1982 by the Cetacean and Turtle Assessment Program (CETAP), at the University of Rhode Island (University of Rhode Island, 1982), under contract to the Minerals Management Service (MMS), Department of the Interior. The following is a summary of some of the information gathered in that study, which covered the area from Cape Sable, Nova Scotia, to Cape Hatteras, North Carolina, from the coastline to 5 nautical miles seaward of the 1,000 fathom isobath.

Four hundred and seventy one large whale sightings, 1,547 small whale sightings and 1,172 sea turtles were encountered in the surveys. The "estimated minimum population number" for each mammal and turtle, as well as those species the area currently included under the Endangered Species Act were also tabulated.

The CETAP concluded that both large and small cetaceans are widely distributed throughout the study area in all four seasons, and grouped the 13 most commonly seen species into three categories, based on geographical distribution. The first group contains only the harbor porpoise, which is distributed only over the shelf and throughout the Gulf of Maine, Cape Cod, and Georges Bank, and infrequently south to Virginia. The second group contains the most frequently encountered baleen whales (fin, humpback, mink, and right whales) and the white-sided dolphin. These are found in the same areas as the harbor porpoise, and also occasionally over the

shelf at least to Florida or out to the shelf edge. The third group "shows a strong tendency for association with the shelf edge" and includes the grampus, striped, spotted, saddleback, and bottlenose dolphins, and the sperm and pilot whales.

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

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

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

XI. LIST OF AGENCIES AND PERSONS CONSULTED IN FORMULATING THE PROPOSED ACTION

The proposed quota was submitted to the National Marine Fisheries Service (NMFS) by the Mid-Atlantic Fishery Management Council.

XII. LIST OF PREPARERS OF THE ENVIRONMENTAL ASSESSMENT

This environmental assessment was prepared by Dr. Thomas B. Hoff of the Mid-Atlantic Council staff and is significantly based on information provided by the Northeast Fisheries Science Center through the most recent two stock assessments for surfclams (USDC 1998a and 2000a) and ocean quahogs (USDC 1998b and 2000b). The staff prepared document entitled: *Overview of the surfclam and ocean quahog fisheries and quota recommendations for 2001* provided significant background information for this environmental assessment.

XIII. ESSENTIAL FISH HABITAT ASSESSMENT

Introduction

This Essential Fish Habitat (EFH) Assessment is provided pursuant to 50 CFR 600.920 of the Essential Fish Habitat Interim Final Rule for the Council to initiate EFH consultation with the National Marine Fisheries Service.

EFH Assessment

Surfclams and ocean quahogs have EFH designated in many of the same bottom habitats that have been designated as EFH for most of the MAFMC managed species of summer flounder/scup/black sea bass, squid/mackerel/butterfish, bluefish, and dogfish, as well as the NEFMC species of groundfish within the Northeast Multispecies FMP, including: Atlantic cod, haddock, monkfish, ocean pout, American plaice, pollock, redfish, white hake, windowpane flounder, winter flounder, witch flounder, yellowtail flounder, Atlantic halibut and Atlantic sea scallops. Numerous species within the NMFS Highly Migratory Species Division and the SAFMC have EFH identified in areas also identified as EFH for surfclams and ocean quahogs. Broadly, EFH is designated as the bottom habitats within the Gulf of Maine, Georges Bank, and the continental shelf off southern New England and the mid-Atlantic south to Cape Hatteras for the juveniles and adults of these two species. Specifically the definitions as approved in Amendment 12 (MAFMC 1999) are:

Surfclams

Juveniles and adults: Throughout the substrate, to a depth of three feet below the water/sediment interface, within federal waters from the eastern edge of Georges Bank and the Gulf of Maine throughout the Atlantic EEZ, in areas that encompass the top 90% of all the ranked ten-minute squares for the area where surfclams were caught in the NEFSC surfclam and ocean quahog dredge surveys. Surfclams generally occur from the beach zone to a depth of about 200 feet, but beyond about 125 feet abundance is low.

Ocean quahogs

Juveniles and adults: Throughout the substrate, to a depth of three feet below the water/sediment interface, within federal waters from the eastern edge of Georges Bank and the Gulf of Maine throughout the Atlantic EEZ, in areas that encompass the top 90% of all the ranked ten-minute squares for the area where ocean quahogs were caught in the NEFSC surfclam and ocean quahog dredge surveys. Distribution in the western Atlantic ranges in depths from 30 feet to about 800 feet. Ocean quahogs are rarely found where bottom water temperatures exceed 60° F, and occur progressively further offshore between Cape Cod and Cape Hatteras.

Any mobile gear that comes into contact with the seafloor in surfclam and ocean quahog EFH may potentially have an impact to these immobile benthic organisms (MAFMC 1999). The gears expected to have the most adverse impact are hydraulic clam dredges and the scallop dredges.

From Auster and Langton (1998) we know that hydraulic clam dredges damage buried bivalves when the dredge does not fully penetrate the bottom to a depth below the horizon where clams occur (Meyer *et al.* 1981). The cutting bar directly breaks clam valves from the force of the dredge moving laterally through the sediments and pushing against high densities of clams. In all studies, the authors made reasonable assumptions regarding levels of damage which will result in direct mortality (e.g., broken hinge, removal of a valve, exposure of soft tissues). However, no studies followed individuals to assess long term mortalities based on damage such as chipped shell margins, which may increase the risk of predation from crustacean predators. The issue of mortality associated with catching but not landing is included in each of the recent stock assessments for surfclams (USDC 1998a and 2000a) and ocean quahogs (USDC 1998b and 2000b).

Assessment of impacts of hydraulic clam dredges in the Middle Atlantic in a closed area with high densities of surfclams by Meyer *et al.* (1981) indicated that when dredge efficiency was low, larger clams which were buried deeper had mortalities as high as 92%. When dredge efficiency was high, mortalities were approximately 30% (Auster and Langton 1998).

Murawski and Serchuk (1989) studied the short-term impacts on benthic communities of bivalve harvest operations in the Middle Atlantic Bight, including scallop dredge and hydraulic clam dredge on various substrate types. Scallops harvested on soft sediment (sand or mud) had low dredge induced mortality for uncaught animals (less than 5%). Culling mortality (discarded bycatch) was low, approximately 10%. Over 90% of the ocean quahogs that were discarded re-burrowed and survived whereas 50% of the surfclams died. Predators such as crabs, starfish, fish and skates, moved in on the ocean quahogs and surfclams within 8 hours post dredging. Murawski and Serchuk (1989) noted numerous "minute" predators feeding in trawl tracks. Non-harvested animals, sand dollars, crustaceans and worms were significantly disrupted but sand dollars suffered little apparent mortality.

Meyer *et al.* (1981) evaluated clam dredge (harvesting ocean quahogs) efficiency over a transect in Long Island Sound, NY. After the dredge passes, it creates a "windrow of clams." The dredge penetrates up to 12 inches and pushes sediment into track shoulders. After 24 hours the track looks like a shallow depression. Clams can be cut or crushed by dredge with mortality ranging from 7 to 92%, being dependent on size and location along dredge path. Smaller clams survive better and are capable of re-burrowing in a few minutes. Predators such as crabs, starfish and snails, move in rapidly and depart within 24 hours.

MacKenzie (1982) studied the long-term impacts of harvesting ocean quahogs in fine to medium sand areas in Southern New Jersey. In areas that are unfished, recently fished, and currently fished for ocean quahogs using hydraulic dredges invertebrates were sampled with a Smith MacIntyre grab. Few significant differences in numbers of individuals or species were noted, and no pattern suggested any relationship to dredging.

The surfclam and ocean quahog fisheries are ITQ fisheries, and as such there is no reason that fishermen have a "rush to fish." One of the great benefits of ITQ fisheries from around the world is that it instills the sense of private property rights and ownership in the resource. Fishermen in these fisheries understand that they are not time driven to rape the resource and that by protecting the resource and its environment they are protecting their long term livelihoods. Unquestionably, ITQs and the way clams are now fished alleviate some environmental damage (Wallace pers. comm.).

The numbers of surfclam and ocean quahog fishermen have also decreased significantly with the implementation

of ITQs. In 1979 there were 162 permitted surfclammng vessels. That number had fallen to 135 vessels the year before (1989) implementation of the ITQ program, and by 1995 the number was only 37. For ocean quahogs the number of vessels were: 59 in 1979, 69 in 1989 and 36 in 1995. Many vessels fish for both surfclams and ocean quahogs and in fact the total number of vessels that fished in 1999 was only 45 (MAFMC 2000a). Most of these current vessels also use sorting machines which make it possible to harvest broken clams which are now not discarded.

A brief discussion on the concept of reserves, or areas where clam dredging would not be allowed, occurred at the June 1998 SARC (USDC 1998b). The idea of reserves was dismissed at this time by the SARC when it was quickly calculated that the greatest possible impact to the bottom, of all the clam dredging for an entire year, would be less than 100 square miles per year. Putting this in context, this 100 square miles is roughly the area of one ten minute by ten minute square. There are over 1200 ten minute squares in the EEZ between Cape Hatteras and Georges Bank.

With the above limited gear impact statements (Auster and Langton 1998), the minimal bottom impact of only 45 vessels, and statements of internationally known invertebrate experts (Drs. Roger Mann of VIMS and Eric Powell of Rutgers who state that the bottom is stirred up more from the average Northeaster than from surfclam dredging) the Council believed that no specific management measures should be proposed for this fishery when Amendment 12 was submitted (MAFMC 1999). The Council solicited public input on clam dredge gear impact during the public hearing process. No public input was received.

According to section 600.815 (a)(4), fishery management options may include, but are not limited to: (I) fishing equipment restrictions, (ii) time/area closures, and (iii) harvest limits.

According to section 600.815 (a)(3) Councils must act to prevent, mitigate, or minimize adverse effects from fishing, to the extent practicable, if there is evidence that a fishing practice is having an identifiable adverse effect on EFH. Some discussions of various gear impacts on bottom in the Mid-Atlantic region has been presented to the Council over the past several years. It is because of this anecdotal information that the Council is considering that all mobile gear coming into contact with the seafloor within surfclam and ocean quahog EFH is characterized as having a potential impact on their EFH (MAFMC 1999). However, the effort of these bottom tending gears is largely unquantified from data that are presently collected by the NEFSC as summarized by Auster and Langton (1998) and therefore no management measures will be proposed at this time. Dr. Joe DeAlteris (University of Rhode Island) is presently attempting to synthesize the historical (1983 to 1993) fishing effort data by area and hopes to have this project complete in the next two years. When specific gear-effort data by area are available the Council will review them and consider whether management measures will be useful.

The requirement concerning gear impact management is to the extent practicable given the evidence that the fishing practice is having an identifiable adverse effect. The Council feels strongly that very little evidence was provided in the synthesis document of Auster and Langton (1998) relative to identifiable adverse effects to EFH in FMPs managed by this Council at this time. Fishing gear impacts along with the description and identification of EFH are frameworked management measures which can easily and readily be changed as more information becomes available (MAFMC 1999). The Council's Habitat Monitoring Committee (MAFMC 1999) should be meeting annually and can provide recommendations concerning gear impacts that NMFS and the Council can act on in the future. The Council feels it would be premature, given the lack of identifiable adverse effects

of gear impacts to these managed species' EFH, to propose gear management measures at this time. It is simply not practicable to impose unwarranted management measures that are unjustifiable. The Council will consider implementing management measures to protect EFH if and when adverse gear impacts are identified.

Many MAFMC, NEFMC, SAFMC, and HMS FMPs for several overfished species include management actions that would effectively reduce gear impacts to bottom habitats by reducing the harvest of the managed species. This reduction in harvesting effort may indirectly benefit EFH by creating an overall reduction of disturbance by a gear type that impacts bottom habitats. Other management actions already in place should control redirection of effort into other bottom habitats. These proposed quotas for 2001 are identical to those for 2000 for ocean quahogs and Maine mahogany ocean quahogs, with only a slight increase in the surfclam quota, and therefore should cause little change in any impacts. Therefore, the MAFMC has determined that this action will have no more than minimal adverse impact upon the listed EFH.

XIV. FINDING OF NO SIGNIFICANT ENVIRONMENTAL IMPACT

Having reviewed the Environmental Assessment For the 2001 Surfclam and Ocean Quahog Fishing Quotas and the available information relating to the proposed action, I have determined that there will be no significant adverse environmental impact resulting from the action and that preparation of an environmental impact statement on the action is not required by Section 102(2)(c) of the National Environmental Policy Act or its implementing regulations.

Assistant Administrator for
Fisheries, NOAA

Date

XV. REFERENCES

- Auster, P.J. and R.W. Langton. 1998. The effects of fishing on fish habitat. Report to American Fisheries Society. April 1998. 34p.
- MacKenzie, C.L. 1982. Compatibility of invertebrate populations and commercial fishing for ocean quahogs. *North American Journal of Fisheries Management*. 2: 270-275.
- Meyer, T.L., R.A. Cooper, and K.J. Pecci. 1981. The performance and environmental effects of a hydraulic clam dredge. *Marine Fish Review*. 43(9): 14-22.
- Mid-Atlantic Fishery Management Council (MAFMC). 1990. Amendment #8 to the fishery management plan for the Atlantic surfclam and ocean quahog fisheries. Dover, DE.
- _____. 1998. Amendment #10 to the fishery management plan for the Atlantic surfclam and ocean quahog fisheries. Dover, DE.
- _____. 1999. Amendment #12 to the fishery management plan for the Atlantic surfclam and ocean quahog fisheries. Dover, DE.
- _____. 2000a. Overview of the surfclam and ocean quahog fisheries and quota recommendations for 2001. Dover, DE.
- _____. 2000b. Regulatory impact review for the 2001 catch specifications for surfclams and ocean quahogs. Dover, DE.
- Murawski, S.A. and F.M. Serchuk. 1989. Environmental effects of offshore dredge fisheries for bivalves. ICES. 1989 Statutory Meeting. The Hague, Netherlands. 12p. 7 figures.
- U.S. Department of Commerce (USDC). 1998a. Report of the 26th Northeast Regional Stock Assessment Workshop (26th SAW), Stock Assessment Review Committee (SARC) Consensus Summary of Assessments. NEFSC Ref. Doc. 98-03.
- _____. 1998b. Report of the 27th Northeast Regional Stock Assessment Workshop (27th SAW), Stock Assessment Review Committee (SARC) Consensus Summary of Assessments. NEFSC Ref. Doc. 98-15.
- _____. 2000a. Report of the 30th Northeast Regional Stock Assessment Workshop (30th SAW), Stock Assessment Review Committee (SARC) Consensus Summary of Assessments. NEFSC Ref. Doc. 00-03.
- _____. 2000b. Report of the 31st Northeast Regional Stock Assessment Workshop (31st SAW), Stock Assessment Review Committee (SARC) Consensus Summary of Assessments. NEFSC Ref. Doc.
- University of Rhode Island. 1982. A characterization of marine mammals and turtles in the Mid and North Atlantic areas of the US outer continental shelf. Final Report. Prepared for USDI under contract #AA551-CT8-48.
- Wallace, D.H. Personal communication. Wallace and Associates, Inc. Salisbury, MD.

**Regulatory Impact Review
for the
2001 Catch Specifications
for
Surfclams and Ocean Quahogs**

October 2000

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2. INTRODUCTION

The National Marine Fisheries Service (NMFS) requires the preparation of a Regulatory Impact Review (RIR) for all regulatory actions that either implement a new Fishery Management Plan (FMP) or significantly amend an existing plan or regulation. The RIR is part of the process of preparing and reviewing FMPs and provides a comprehensive review of the changes in net economic benefits to society associated with proposed regulatory actions. The analysis also provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives that could be used to solve the problems. The purpose of the analysis is to ensure that the regulatory agency systematically and comprehensively considers all available alternatives so that the public welfare can be enhanced in the most efficient and cost-effective way.

The RIR addresses many items in the regulatory philosophy and principles of Executive Order (E.O.) 12866. The RIR also serves as the basis for determining whether any proposed regulation is a "significant regulatory action" under certain criteria provided in E.O. 12866.

3. MANAGEMENT OBJECTIVES

The objectives of the surfclam and ocean quahog FMP are:

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

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

Federal Surfclam & Ocean Quahog Quotas and Landings: 1990 - 2001							
Surfclams (Thou Bushels)				Ocean Quahogs (Thou. Bushels)			
* Georges Bank first closed for PSP in 1990				* Maine ocean quahog fishery excluded 1991 - 1999			
Year	Landings	Quota	Percent Harvested	Year	Landings	Quota	Percent Harvested
1990*	3,114	2,850	109%	1990	4,622	5,300	87%
1991	2,673	2,850	94%	1991*	4,840	5,300	91%
1992	2,812	2,850	99%	1992*	4,939	5,300	93%
1993	2,835	2,850	99%	1993*	4,812	5,400	89%
1994	2,847	2,850	100%	1994*	4,611	5,400	85%
1995	2,545	2,565	99%	1995*	4,628	4,900	94%
1996	2,569	2,565	100%	1996*	4,391	4,450	99%
1997	2,414	2,565	94%	1997*	4,279	4,317	99%
1998	2,365	2,565	92%	1998*	3,897	4,000	97%
1999	2,538	2,565	99%	1999*	3,770	4,500	84%
2000	N/A	2,565	N/A	2000	N/A	4,500	N/A
2001**	N/A	2,850	N/A	2001**	N/A	4,500	N/A
**2001 quotas are Council recommendations Source: NMFS Clam Logbook Reports, Woods Hole, MA							

3.1. Surfclam Policy Objectives

Council policy is to set the surfclam quota within the OY range (1,850,000 to 3,400,000 bushels) at a level that will allow fishing to continue at that level for at least 10 years, and within the above constraints the quota may be set taking into account economic information to set the quota to consider net economic benefits over time to consumers and producers, within the framework of greatest national benefit.

At the March 2000 Council meeting, the Council (after reviewing the December 1999 surfclam SARC report) passed a motion that, "given the recent stock assessment, we consider an increase in quota to the 3.4 million bushel OY over the next 5 years with a 10% increase the first year."

3.2. Ocean Quahog Policy Objectives

Council policy is to set the ocean quahog quota within the OY range (4,000,000 to 6,000,000 bushels) at a level that will allow fishing to continue at that level for at least 30 years, and within the above constraints the quota may be set taking into account economic information to set the quota to consider net economic benefits over time to consumers and producers, within the framework of greatest national benefit.

4. DESCRIPTION OF THE SURFCLAM AND OCEAN QUAHOG FISHERIES

4.1. Description of the Atlantic Surfclam Fishery

4.1.1. Surfclam Overview

Surfclams are bivalve mollusks which are distributed in the western North Atlantic from the southern Gulf of St. Lawrence to Cape Hatteras. Commercial fisheries have generally concentrated on the populations of surfclams which have flourished in the sandy ocean sediments off the coast of New Jersey and the Delmarva peninsula. Growth rates are relatively rapid, with clams reaching preferable/harvestable size (approximately 5 inches) in about six years. Maximum size is about 9 inches in length, though individuals larger than 8 inches are rare. They have a longevity of approximately 35 years, and while some individuals reach sexual maturity within three months, most spawn by the end of their second year.

In the Mid-Atlantic region, surfclams are found in the relatively shallow waters from the beach zone to a depth of about 180 feet. Substantial fisheries exist in the 3-mile jurisdictions of the States of New Jersey and New York.

Traditionally, surfclams' dominant use has been in the "strip market" to produce fried clams. In recent years, however, they have increasingly been used in chopped or ground form for other products, such as high-quality soups and chowders.

4.1.2. Surfclam Pricing

Exvessel prices for surfclams can vary considerably depending on the quality and meat yield of surfclams from a particular area. Surfclam beds in New York state waters and off the Delmarva peninsula tend to have lower meat weights and command lower prices. Prices will also depend on the nature and terms of contracts which fishermen and allocation holders enter into with processors. The markets for surfclams and ocean quahogs have varied over time, and individual fishermen may choose to accept a lower price for his allocation of one species in return for assurances that the processor will purchase his allocation of the other species. Some allocation holders and processors choose to enter into multi-year contracts with each other, while others do not.

The reported prices in fishermen's logbooks for 1999 ranged from a low of \$5.00 per bushel to a high of \$12.00 per bushel for surfclams. Unfortunately, pricing data as it is currently collected is ambiguous for both surfclams and ocean quahogs. Under an individual allocation system, there are two components to the value of any particular harvest: 1) the actual cost of vessel and crew services in harvesting the catch, or "harvest services," and 2) the limited access or lease value which is created when only a limited number of individuals are granted legal access to a public resource. An ITQ system allows individuals the flexibility to harvest their annual share of the quota themselves, or to "lease" a portion or all of their harvest rights to others. Current lease prices for surfclams (as of mid-2000) are in the neighborhood of \$5.00 per bushel.

Reported prices in fishermen's logbooks, however, do not specifically indicate whether a particular sale price includes the value of the lease, or not. If a vessel was fishing for a processor using allocation that was owned by the processor, then the vessel will receive a much lower price which reflects harvest services only (currently in the \$5.00 - \$6.00 range). If a vessel owns its own allocation, then the price for a good-quality bushel of federal surfclams will be in the \$8.00 - \$12.00 range. Prices for surfclams fell substantially from 1997 to 1998 under

slack demand, causing the median price to drop from \$12.00 to \$10.00 per bushel. In 1999 the price continued to edge downward until stabilizing in the latter part of the year. The outlook now appears brighter in 2000, as surfclam harvests have increased in order to substitute for ocean quahogs, whose thinning ranks have made them more costly to harvest.

While many vessels will harvest both surfclams and ocean quahogs in a given year, surfclams have always been the preferred catch due to the higher price which they command. While meat yields can vary substantially with geographic location and from year-to-year, the standard government conversion factor is for 1 bushel of surfclams to yield 17 pounds of meats, and has been in use since the 1970's. For the smaller, less-desirable ocean quahog, the accepted standard is for 1 bushel to produce 10 pounds of meats.

4.1.3. Recent Fishery Performance - Surfclams

Surfclam Landings: Both State and Federal Waters					
Region	1998			1999	
	Bushels	Value		Bushels	Value
New England States	98,575	\$1,204,330		52,262	\$678,116
Mid-Atlantic States	3,058,134	\$27,781,605		3,410,232	\$29,765,459
Total	3,156,709	\$28,985,935		3,462,494	\$30,443,575
Source: NMFS Unpublished Landings Data, Woods Hole, MA					

Coastwide landings of surfclams totaled 3.46 million bushels (bu) in 1999, an increase of 9.7% from the 3.16 million bushels landed in 1998. This reverses a trend which had seen landings decrease by 5% and 11.2% in the prior two years. Reported exvessel value increased 5.0% from \$29.0 million to \$30.4 million dollars. The improvement in the fortunes of surfclam fishermen is due largely to two factors: 1) the industry has been substituting surfclams for ocean quahogs as ocean quahog meats have become more expensive to produce, and 2) processors have had greater success in selling surfclam products relative to recent years. Industry has reported some success in marketing a thick, new "super-strip" product that is generated mainly from hand-shucked clams.

In recent years, surfclams have been harvested from four different jurisdictional areas: the federal EEZ, and the state waters of New Jersey, New York, and Massachusetts. All but Massachusetts have established management regimes which include annual quotas and harvest limits for individual vessels. In 1999, quotas were fully harvested from New Jersey and federal waters for the first time in years, while New York still retains a surplus.

4.1.4. The New Jersey Inshore Fishery for Surfclams

New Jersey manages the largest state fishery for surfclams. A constant annual quota of 600,000 bushels had been maintained for years until this past 1999/2000 season, when the quota was increased to 700,000. New Jersey is unique in defining a season which begins in October of one calendar year and closes at the end of May in the next.

New Jersey Surfclam Fishery				
Season (Oct - May)	Quota (bu)	Landings (bu)	Bushels Unharvested	Percent Unharvested
FY 95/96	600,000	566,120	33,880	6%
FY 96/97	600,000	468,377	131,623	22%
FY 97/98	600,000	467,569	132,431	22%
FY 98/99	600,000	570,852	29,148	5%
FY 99/00	700,000	699,649	351	.05%
Source: New Jersey Division of Fish, Game, and Wildlife				

Many vessels in the New Jersey inshore fishery for surfclams also participate in the federal fishery. For the recently completed fishing year (May 2000), less than one-half of one percent of the quota was left unharvested. The past two fishing years represent a significant improvement relative to the prior two seasons, which saw fully 22% of the quota unharvested each year. Fortunately, vessels experienced virtually no problems in selling their catches in the recently completed fishing year. There are 57 licenses for inshore New Jersey. Up to three licenses can be combined onto one vessel.

4.1.5. The New York Inshore Fishery for Surfclams

New York inshore waters are divided into two segments: Long Island Sound and Atlantic Ocean waters out to three miles. While there are approximately 100 permits for the Long Island Sound area, the quantity of surfclams landed from that area is very small. With attractive shells of a golden-brown color, these surfclams are often harvested by hand, and sold fresh into sushi and premium bait markets.

The vast majority of New York state waters' harvest is from the Atlantic Ocean area, for which there are currently 23 moratorium vessel permits, held by 15 owners (Fox pers. comm.). When a moratorium and quota management were instituted in 1994, there were a total of 25 moratorium vessel permits issued. Two of these permits were canceled for failing to meet the minimum harvest requirement of 5,000 bushels per year. (This requirement has since been repealed.)

New York Inshore Quotas and Landings of Surfclams			
Year	Quota (bu)	Harvest (bu)	Percent Over or Under Quota
1990	(none)	720,473	
1991	(none)	713,019	
1992	(none)	719,351	
1993	(none)	856,366	
1994	500,000	523,281	5 % over
1995	500,000	420,855	16 % under
1996	500,000	451,492	10 % under
1997	500,000	389,014	22 % under
1998	500,000	227,000	55% under
1999	500,000	255,194	49% under
2000	500,000	101,870 (first half year)	60% under for first half
Source: NY Dept. of Environmental Conservation			

The average catch from New York waters was approximately 173,000 bushels annually for the 20-year period spanning the 1970's and 1980's. Catches soared in 1990 with implementation of ITQ management in the federal fishery, as surplus vessels sought alternative areas to fish.

Harvests peaked in 1993 at just over 850,000 bushels, and have since trended significantly downward. As the market for surfclams began shrinking in the mid 1990s, the black, lower-yielding resource off New York's Atlantic coast has most strongly felt the effects. As of July 2000, more than half of the 23 vessel fleet had been idled for the past six months (Fox pers. comm.). Six vessels fishing for one owner and two for another owner were the only vessels that were consistently fishing. Many could be found either sunk, in a land fill, or tied to the dock for more than the past year.

The New York State Department of Environmental Conservation staffer who heads New York's surfclam program is Dick Fox. In a July 2000 contact he emphasized that the landings decline is not due to any problems associated with the resource. The New York surfclam survey was completed in the summer of 1999, and there are "clams everywhere," an outcome which is similar to what their 1996 survey found. Fox believes that the landings for New York are not higher because the market does not need their clams.

NY Atlantic Surfclam Landings: Jan - June Comparison			
Year	First Quarter	Second Quarter	Half-Year Total
1994	119,623	119,251	238,874
1995	106,689	105,063	211,752
1996	117,738	119,053	236,791
1997	112,196	109,928	222,124
1998	76,003	59,339	135,342
1999	63,460	63,445	126,905
2000	73,170	28,700	101,870

Source: NY Dept. of Environmental Conservation

A comparison of the landings for the first half of each year since 1994 indicates that the significant unemployment currently being experienced by the New York fleet is not completely a seasonal phenomenon. Landings in 1998 and 1999 were down between 40 and 50 percent from the same period in prior years with 2000 showing a similar pattern to 1998 and 1999.

In recognition of the difficulty which fishermen were having finding a market for their surfclams, in 1998 the State of New York waived the 5,000 bushel minimum harvest requirement (in order to maintain a moratorium permit).

4.1.6. The Federal Surfclam Fishery

The federal fishery for surfclams was conducted by a total of 33 vessels in 1999, an increase of two vessels from the number participating in 1998 (Table 1). Relative to the 128 vessels reporting harvests of surfclams at the initiation of the ITQ program in 1990, this represents a 74% reduction in this sector of the fleet.

- Ž The harvest of surfclams from federal waters totaled 2,538 million bushels in 1999, and represents the first time the federal quota has neared full utilization since 1996.
- Ž Exvessel prices edged only slightly lower in 1999 after falling sharply in 1998. The median 1999 price of \$10.00 per bushel declined from \$12.00 in 1997.
- Ž Effort was spread across 2,155 individual trips, harvesting an average 1,178 bushels (36.8 cages) per trip.
- Ž A fleet-wide calculation of Landings Per Unit of Effort (LPUE) showed that the industry average increased approximately 12% to 127 bushels per hour in 1999 (Table 1).
- Ž Harvests continue to be concentrated off the coast of New Jersey, with 62% of the catch coming from the “New Jersey Nearshore” (3973) degree square (Table 4). Average LPUE for this square increased 15% for Class 3 vessels in 1999, though it is still down substantially from catch rates attained in the late 1980's.

4.1.7. Biological Status of the Surfclam Resource - Assessment Findings from the 30th SARC – December

1999

- Ž The EEZ surfclam resource is at a high level of biomass and is under-exploited.
- Ž The majority of the catch is derived from the Northern New Jersey (NNJ) area which contains about 39% of the coast-wide resource (Figure 4). Large fractions of the resource are exploited at low levels (Delmarva containing 25% of the resource) or not at all (Georges Bank containing 21% of the resource).
- Ž Estimated mean annual fishing mortality rates from 1997-1999 were 0.02 for the entire EEZ resource, 0.03 - 0.04 for the NNJ region, and 0.04 - 0.07 for the SNJ region.
- Ž Age composition data from the 1997 survey for NNJ and Delmarva indicate that the populations contain at least 18 cohorts, none of which are dominant. The length frequencies for these two regions between the 1997 and 1999 surveys did not significantly vary.
- Ž Fishing mortality can be increased for the surfclam resource taken as a whole. However, it may be advantageous to avoid localized depletion.

4.2. Description of the Ocean Quahog Fishery

4.2.1. Ocean Quahog Overview

Ocean quahogs are found in the colder waters on both sides of the North Atlantic. Off the United States and Canada, they range from Newfoundland to Cape Hatteras at depths from 25 feet to 750 feet. Industry has been pressing the limits of current technology in harvesting ocean quahogs as deep as 300 feet in the waters off southern New England. As one progresses northward, ocean quahogs inhabit waters closer to shore, such that the State of Maine has a small commercial fishery which includes beds within the State's 3-mile zone.

Ocean quahogs are one of the longest-living, slowest growing marine bivalves in the world. Under normal circumstances, they live to more than 100 years old. Ocean quahogs have been aged in excess of 200 years. The exceedingly slow growth rate has given rise to such descriptions as "living rocks," or "miniature redwood trees." They require roughly twenty years to grow to the sizes currently harvested by the industry (approximately 3 inches), and reach sexual maturity between 5 and 10 years of age.

Traditionally, the dominant use of ocean quahogs has been in such products as soups, chowders, and white sauces. Their small meat has a sharper taste and darker color than surfclams, which has not permitted their use in strip products or the higher-quality chowders. With their lower exvessel price (typically between \$4.00 - \$4.75 per bushel in 1999 for the full "lease plus harvest" value), ocean quahogs continue to be a bulk, low-priced food item. As in other fisheries such as Atlantic mackerel, the industrial ocean quahog fishery appears viable only when large quantities can be harvested quickly and efficiently. When catch rates fall below a certain point, vessels tend to shift their effort to higher-yielding areas. Industry members have indicated that crews are more willing to work on ocean quahog trips if they are also allowed to fish on surfclam trips, which pay much more per hour for their labor.

As will be discussed in more detail in the following sections, there had been a shift toward greater utilization of the lower-priced ocean quahog meats in the years 1997 and 1998. Both years saw almost all of the ocean quahog quota harvested, while surfclam quota was left unharvested on the ocean floor. However this trend reverted back to the historical norm in 1999 as fuel prices spiked, and it became relatively more expensive to harvest ocean quahogs which are found farther offshore. Higher fuel prices combined with the increasing scarcity of dense ocean quahog beds has resulted in an overall decline in ocean quahog harvests. Industry focus returned to surfclams and they harvested virtually 99% of the federal surfclam quota, while leaving 16% of the ocean quahog quota unharvested.

4.2.2. Recent Fishery Performance - Ocean Quahogs

Ocean Quahog Landings: Both State and Federal Waters (Excludes Maine fishery)					
Region	1998			1999	
	Bushels	Value		Bushels	Value
New England States	2,090,237	\$8,733,540		1,835,383	\$7,634,346
Mid-Atlantic States	1,821,005	\$7,778,674		1,936,735	\$8,273,702
Total	3,911,242	\$16,512,214		3,772,118	\$15,908,048

Source: NMFS Unpublished Landings Data, Woods Hole, MA

Landings of ocean quahogs from the high-volume fishery outside the State of Maine totaled 3.772 million bushels in 1999, a decrease of 3.6% from 1998. This fell on the heels of an 8.6% decline experienced the year before. Much of the larger, earlier reduction was due to the federal quota for ocean quahogs being reduced by 7% in 1998. Reported exvessel value declined 3.7% from \$16.5 million dollars to \$15.9 million in 1999.

4.2.3. The Federal Ocean Quahog Fishery

A total of 23 vessels participated in the 1999 fishery for ocean quahogs in federal waters apart from Maine. Since 1996 there has been a dramatic exodus from the fishery; federal ocean quahog vessel numbers had been stable at 36 for the prior four years, back to 1993. Two of these vessels sank in weather-related accidents during January 1999, however the remainder left the fishery voluntarily.

- Ž Of greatest significance is the fact that fully 16% of the 1999 federal ocean quahog quota was left unharvested in the ocean. In 1996 and 1997 the quota had been binding on the industry, so the Mid-Atlantic Council recommended the quota be raised from 4.0 to 4.5 million bushels in 1999. None of this increase was tapped by the industry, and one can observe that landings have actually been on a declining trend from the 4.9 million bushel peak in 1992.
- Ž Exvessel prices have remained largely unchanged from 1997 through 1999, with more than three quarters of the trips reporting the sale of their catch at \$4.25 per bushel.
- Ž Effort in 1999 was comprised of 2,078 individual trips, which harvested an average 1,814 bushels (56.7 cages) per trip.

- Ž A fleet-wide calculation of Landings Per Unit of Effort showed that the average yield continued its recent steady decline by 3.3% in 1999, from 123 to 119 bushels per hour of fishing (Table 2).
- Ž Harvests of ocean quahogs continue to be distributed over a larger geographic area than surfclams, although over one-third of the 1999 catch came from the degree square off of eastern Long Island. LPUE for Class 3 vessels increased modestly in this square, while the total harvest fell by 240,000 bushels compared to 1998 (Table 4).
- Ž Larger catches were taken from areas south of Block Island (4071) and Martha's Vineyard (4070) in 1999, though LPUE values for these areas declined (Table 5).
- Ž Limits on the continued movement of the fleet eastward are still impeded by the closure of surfclam and ocean quahog beds east of the 69° line, due to the presence of PSP toxin. Vessels responded by pursuing ocean quahogs in the deeper waters further from shore.

4.2.4. Biological Status of the Ocean Quahog Resource - Assessment Findings from the 31st SARC – June 2000

- Ž The ocean quahog resource in surveyed EEZ waters from Southern New England (SNE) to southern Virginia (SVA) is not overfished and overfishing is not occurring.
- Ž The current biomass is high with current catches near MSY.
- Ž Fully 36% of the current biomass is in the unfishable region of Georges Bank (Figure 5).
- Ž Annual recruitment is approximately 1 - 2% of stock biomass and lower than, or roughly equal to, the rate of natural mortality.
- Ž The percentage of virgin biomass in the assessed areas (not including Georges Bank because of PSP unavailability) is 82%.
- Ž The stock off the coast of Maine continues to be harvested, but the condition of the resource there is unknown.
- Ž Current fishing mortality is near F_{target} for the resource taken as a whole. However, it may be advantageous to avoid localized depletion.

4.2.5. The Maine Ocean Quahog Fishery

In addition to the high-volume, ITQ fishery for surfclams and ocean quahogs, there is a small-scale fishery for ocean quahogs operating off the coast of Maine north of 43 degrees 50' N. latitude. The major ocean quahog fishery is an industrial enterprise, conducted by large vessels operating in deep, offshore waters. Ocean quahogs are dislodged from the seabed using large, hydraulic dredges which shoot jets of water from their leading edge. Once on board, ocean quahogs are stored in metal cages holding 32 bushels each. Back at the dock, cranes lift the cages into tractor trailers for shipment to processing plants, where they are steamed open, thoroughly

washed, and processed into a variety of product forms. These primarily take the form of diced meat, chowders and sauces. Reported prices, relatively constant during the past two decades, have ranged from about \$3.00 to \$4.75 per bushel.

By contrast, the small-scale Maine ocean quahog fishery utilizes small (36" maximum cutter bar length), dry dredges, on boats typically ranging between 30 and 40 feet in length. Participation is seasonal, with the heaviest landings centered around the summer holidays of Memorial Day, July 4, and Labor Day. Only a handful of vessels remain in the fishery year-round.

The ocean quahogs targeted by these vessels are smaller than in the industrial fishery, ranging between 1.5" and 2.5", and destined for the fresh, half-shell market. Average exvessel price in 1999 was \$27.55 per bushel, though prices have reached as high as \$45.00 per bushel in 1991. Larger ocean quahogs are discarded, and the retained individuals are stored on ice in ½ bushel onion bags below deck. Depending upon demand, the ocean quahogs are either landed directly and trucked out to retail markets the same day, held in a local dealer's cooler, or stored in floating pens for up to three days. The storage in pens also allows the ocean quahogs to deplete silt and body waste (McGowan pers. comm.).

Amendment 10 to the Atlantic Surfclam and Ocean quahog FMP specified management measures tailored to the Maine fishery, and took effect on May 21, 1998. The principal management measures included: 1) establishment of a Maine ocean quahog management zone north of 43 degrees 50' N. latitude, 2) establishment of a Maine ocean quahog permit, and 3) establishment of an initial annual quota of 100,000 Maine bushels for the management zone.

Vessels holding a Maine ocean quahog permit and fishing on the quota specified for the Maine management zone were exempted from the special requirements of the ITQ fishery. These include the obligation to "call-in" trip departure and landing times to NMFS, landing harvests in metal cages of a specific size, and accompanying shipments with the serialized tags issued to holders of ocean quahog allocation shares.

Maine Ocean Quahog Landings*	
Year	Maine Bushels
1984	43
1985	0
1986	124,530
1987	92,113
1988	88,054
1989	55,175
1990	51,233
1991	36,679
1992	24,839
1993	17,144
1994	26,890
1995	50,471
1996	69,067
1997	72,706
1998	72,466
1999	93,938
* From multiple sources: NMFS unpublished weighout files, NMFS shellfish logbook files, and NMFS Multispecies logbook files. Preliminary data.	

Available landings data for the Maine quahog fishery are subject to greater uncertainty than the ITQ fisheries. A single reporting channel did not exist until the State of Maine sent out a letter to fishermen in 1998 requesting that all ocean quahog harvests be reported in the NMFS shellfish logbooks. Prior to that time, ocean quahog landings data had been submitted in NMFS Multispecies logbooks, NMFS shellfish logbooks, and through dealers reports. Duplicate reporting did occur, and efforts to correct for double counting were difficult and time consuming. Additional uncertainty was created by the fact that dealers were required to pay a tax to the State on every bushel of quahogs landed, thus creating an incentive to under-report landings.

In spite of the uncertainty inherent in the early landings data, a clear U-shaped trend is apparent. The fishery started in earnest in 1986, with recorded landings exceeding 124,000 bushels. This initial boom year also corresponds to the peak landings made to date. Landings declined steadily through the late 1980's and early 1990's, reaching a low of just over 17,000 bushels in 1993. While the underlying reasons for the decline are not fully explained, it is thought that both difficulties in finding a market as well as depletion of local beds played a part.

Landings rebounded in the years following 1993, and climbed steadily to the 94,000 bushels landed in the most

recent year of 1999. Verbal reports from Maine suggest that vessels moved on to some new, virgin beds during this interval. Preliminary landings reports as of August 31, 2000 totaled just over 82,000 bushels, and suggest that the Maine fishery may reach the 100,000 bushel quota level allocated to the non-ITQ fishery before the year ends. If fishermen wish to continue harvesting after this quota is reached, they must purchase allocation from the ITQ portion of the ocean quahog fishery.

Informal communications with Maine quahog fishermen and State officials indicate that there are no concerns at present relative to resource depletion in the Maine management zone. However, the extent of the resources off Maine are largely unquantified, since a survey and assessment have not been conducted. The State of Maine is responsible for conducting a survey when funding becomes available. Near-term priorities have been focused elsewhere, given the small number of vessels involved in the Maine quahog fishery relative to others, such as lobsters. In 1999 there were a total of 38 vessels reporting landings of ocean quahogs in Maine

4.3. Operation of the ITQ System

Prior to the adoption of an Individual Transferable Quota system in September 1990, the primary management tools employed to prevent overfishing were annual quotas for both species, and a vessel moratorium combined with severe effort restrictions that applied only to the high-value surfclam fishery. In the final year of the effort management system, those vessels holding a surfclam moratorium permit were only allowed to make six trips per quarter, and could have their dredge in the water no more than six hours per trip. The replacement of aging vessels was complicated by the need to restrain harvesting capacity. The government was put in the uncomfortable position of questioning the transfer of moratorium permits from old, unsafe vessels to larger, more efficient vessels if it was likely to increase the fishing power of the fleet. Finally, enforcing the effort-based system was very expensive, since it required the use of Coast Guard cutters and aircraft to monitor the operation of vessels at sea.

All of these concerns were addressed with the implementation of ITQ management on September 30, 1990 (MAFMC 1990). Vessels owners were issued an allocation percentage for each species based primarily on their past participation in each fishery. Prior to the start of each fishing year, each allocation owner is issued a series of numbered "cage tags" that correspond to their percentage share of the upcoming year's quota. Cage tags represent the "currency" of the Individual Transferable Quota system, and can be freely traded among industry participants so they can tailor their harvests to a level which meets their particular needs and business plans. Each tag must be fastened to a cage (shipping container) containing up to 32 bushels of either species, and allows for the legal transport of that species to a processing facility.

The requirements for vessel moratorium permits, as well as all effort restrictions were rescinded at the time of ITQ program implementation. Fleet efficiency and profitability were immediately enhanced with the ability to consolidate harvests on to fewer vessels. Enforcement costs declined substantially as attention was shifted from at-sea monitoring to shore-based efforts that simply seek to ensure that all landings make proper use of cage tags. Reports from both industry and enforcement personnel have supported the fact that violations of the plan regulations have dropped markedly under the ITQ system.

4.4. Description of User Groups

4.4.1. Harvesting Sector

The total number of vessels participating in the surfclam and ocean quahog fishery outside the State of Maine declined by 2 vessels in 1999. As opposed to past reductions which were the result of fishing operations being consolidated on to fewer vessels, this decline was due to the loss of four vessels in weather-related accidents in January of 1999.

Federal Fleet Profile				
Non-Maine Vessels	1996	1997	1998	1999
Harvests BOTH surfclams & ocean quahogs	14	14	8	11
Harvests only surfclams	20	19	23	22
Harvests only ocean quahogs	22	17	16	12
Total Non-Maine Vessels	56	50	47	45
Maine Ocean Quahog Vessels	25	34	39	38
Source: NMFS Clam Vessel Logbooks				

The major fleet shift which is apparent over time is the reduction in numbers of vessels participating in the fishery for ocean quahogs. While the total number of vessels in the federal surfclam and ocean quahog fleet declined 16% from 1996 to 1998 (from 56 to 47 vessels), that portion which participates in the harvest of ocean quahogs dropped by fully one-third over the same interval (from 36 to 24 vessels).

4.4.2. Processing Sector

In 1999 there were a total of 10 companies which were reported as having made purchases of surfclams or ocean quahogs outside the State of Maine. Dealer reports are required of all entities receiving federal harvests of these two species managed under the ITQ system.

The largest processor is Sea Watch International, based in Milford, Delaware. Listed from north to south, the processors are arrayed as follows:

Massachusetts

Fair Tide Shellfish LTD.

Rhode Island

Blount Seafood Corp.

Galilean Seafood Inc.

New Jersey

Atlantic Capes Fisheries, Inc.

Cape May Cannery Inc.

Cape May Fisheries CO-OP Inc.
Surfside Products Inc.
Delaware
Sea Watch International
Virginia
Eastern Shore Seafood Products
J H Miles & Company Inc.

Ownership of multiple plants results in there effectively being five major processing entities in the industry. There is an increasing trend toward vertical integration, where companies own both vessels and processing facilities. The most recent example is the merger of Sea Watch International and the Truex fleet of vessels in the summer of 1999.

There were a total of 10 entities in the State of Maine to whom vessels reported selling ocean quahogs in 1999:

1. Al's Seafood
2. Atlantic Shellfish
3. Beals Lobster Co., Inc.
4. CNW Seafood
5. Kip's Seafood Co.
6. Machias Bay Seafood
7. Maine's Best Seafood, Inc.
8. Moosabec Mussels, Inc.
9. North Atlantic Seafood
10. Old Salt Seafood

4.4.3. Differing Perspectives of the Harvesting and Processing Sectors

4.4.3.1. Harvesting Sector

For those entities in the harvesting sector that are not vertically integrated, key motivating factors include:

- Ž Harvesting fisheries products efficiently and at the lowest possible cost.
- Ž Obtaining the highest possible price for the products they sell.
- Ž Retaining a skilled crew to operate fishing vessels and minimize the costs associated with high crew turnover.

Those vessel owners that also own a substantial portion of the allocation which they harvest are additionally motivated to ensure that the value of the allocation itself is maintained. Factors which might influence the resale value of an allocation include the depletion of the biological resource which it represents, thus lowering its market value, or a change in demand for the resource, which could increase or decrease its value.

4.4.3.2. Processing Sector

The processors of fishery products tend to have a substantially different set of motivating forces in the

environment in which they must do business. High among their concerns are:

- Ž Maintaining steady, and reliable sources of raw materials for their production processes, which helps ensure their ability to satisfy customer orders in a timely manner.
- Ž Obtaining raw materials at the lowest possible price.
- Ž Maintain a production schedule which provides stable employment for their workforce, and reduces the costs of idled plant equipment.

For those participants in the surfclam and ocean quahog industry which do not have a “vertically-integrated” operation (owning both fishing vessels and processing plants), a particular dynamic takes shape. First, as in all fisheries, there are inherent, conflicting interests relative to the market selling price. Fishermen are motivated to obtain as high a price as possible for their catch, and processors are motivated to obtain the raw materials for their processing lines at the lowest possible price. In this way each maximizes the profitability of their operations.

4.4.3.3. The Effects of Quotas

Quotas tend to be viewed quite differently by the harvesting and processing sectors as well. For fishermen in an ITQ-managed fishery, quotas can be seen as having both positive and negative aspects. In one sense, they represent an unwelcome cap on potential income. Whatever price they receive for their catch multiplied by their bushel share of the quota represents their maximum gross income for the year.

A more welcome aspect of quotas to fishermen is the price support which may result from limits on the supply of a particular product. Tighter supplies of a fisheries product would give the fishermen who possess that product additional leverage when negotiating prices with processors.

Processors, on the other hand, have reason to view quotas as an additional, unwelcome constraint on the raw materials their business requires. In producing any particular product, there will be a range of “ingredients” which may be utilized in the manufacturing process. Their availability and cost may well vary with the season of the year. The profitability of operations can be enhanced when a manufacturer has the greatest flexibility in the choice of ingredients, and their supply is abundant and cheap.

When governmental bodies impose limits on when and how much of a particular fishery resource can be harvested, they also limit the flexibility which manufacturers have in choosing the least expensive ingredient (that is of acceptable quality) to use in their products. In the coast wide surfclam and ocean quahog fisheries, annual quotas exist for both species in federal waters, as well as in the state jurisdictions of Maine (for ocean quahogs), New York (surfclams) and New Jersey (surfclams). A seasonal limit also exists in New Jersey state waters for surfclams, where harvests are allowed from October through May.

In negotiating purchase prices with vessel and allocation owners, processors will have the strongest bargaining position when quotas are sufficiently high so as to not be a constraint on their businesses.

5. PROBLEM STATEMENT

5.1. Proposed Action

Regulations implementing the Fishery Management Plan for the Atlantic Surfclam and Ocean Quahog Fisheries (FMP) require the Council to make recommendations on the allowable harvest from Federal waters each year. The regulations may be found at 50 CFR Part 648.71, and state as follows:

Sec. 648.71 Catch quotas.

(a) *Surfclams*. The amount of surfclams that may be caught annually by fishing vessels subject to these regulations will be specified by the Assistant Administrator, on or about December 1 of each year, within the range of 1.85 to 3.4 million bu (98.5 to 181 million liters).

(1) *Establishing quotas*. (i) Prior to the beginning of each year, the MAFMC, following an opportunity for public comment, will recommend to the Assistant Administrator quotas and estimates of DAH and DAP within the ranges specified. In selecting the quota, the MAFMC shall consider current stock assessments, catch reports, and other relevant information concerning:

(A) Exploitable and spawning biomass relative to the OY.

(B) Fishing mortality rates relative to the OY.

(C) Magnitude of incoming recruitment.

(D) Projected effort and corresponding catches.

(E) Geographical distribution of the catch relative to the geographical distribution of the resource.

(F) Status of areas previously closed to surfclam fishing that are to be opened during the year and areas likely to be closed to fishing during the year.

(ii) The quota shall be set at that amount that is most consistent with the objectives of the Atlantic Surfclam and Ocean Quahog FMP. The Assistant Administrator may set quotas at quantities different from the MAFMC's recommendations only if he/she can demonstrate that the MAFMC's recommendations violate the national standards of the Magnuson Act and the objectives of the Atlantic Surfclam and Ocean Quahog FMP.

And continue in Sec. 648.71 (b):

(b) *Ocean quahogs*. The amount of ocean quahogs that may be caught by fishing vessels subject to these regulations shall be specified annually by the Assistant Administrator, on or about December 1, within the range of 4 to 6 million bu (213 to 319.4 million liters), following the same procedures set forth in paragraph (a) of this section for surfclams.

6. MANAGEMENT ALTERNATIVES

6.1. Quotas for the ITQ Fisheries

Proposed 2001 Quota Alternatives			
Surfclams			
	<u>Description</u>	<u>Quota (bushels)</u>	<u>% Change from 1999</u>
Alt. S1	Min. Allowable	1.850 million	28% Decrease
Alt. S2	1998 Harvest Level	2.365 million	8% Decrease
Alt. S3	Status Quo	2.565 million	No Change
Alt. S4**	Slight Increase	2.850 million	11% Increase
Alt. S5	Max. Allowable	3.400 million	33% Increase
Ocean Quahogs			
Alt. Q1	Min. Allowable	4.000 million	12% Decrease
Alt. Q2	Partial Reduction	4.250 million	6% Decrease
Alt. Q3**	Status Quo	4.500 million	No Change
Alt. Q4	Slight Increase	4.75 million	6% Increase
Alt. Q5	Max. Allowable	6.000 million	33% Increase
** Council Recommendation			

Five alternative quota levels were identified for consideration in each of the two fisheries. The Council's choice was bounded by minimum and maximum quota levels that are specified as the Optimum Yield (OY) range in the Surfclam and Ocean Quahog Fishery Management Plan, and may not be exceeded in either direction without an amendment to the Plan.

For each fishery, the quota alternatives numbered 1 and 5 correspond to the minimum and maximum allowable quotas specified in the current OY range:

Surfclams 1.850 million to 3.400 million bushels

Ocean Quahogs 4.000 million to 6.000 million bushels

Alternative #3 for each species corresponds to the status quo and would maintain the 2000 quotas of 2.565 million bushels for surfclams, and 4.5 million bushels for ocean quahogs unchanged for another year. This alternative is recommended by the Council and staff as the preferred alternative for ocean quahogs.

Alternative #2 for each species represents a reduction of the annual quotas in the 6 - 8 percent range. As will be discussed in the sections below, it is put forth as an option to address economic concerns in each fishery. For

surfclams, it corresponds to the actual federal harvest level attained in 1998. The actual 1998 harvest level for ocean quahogs (3.897 million bu.) is not a valid quota option because it lies below the minimum OY range point of 4 million bushels. For this reason, the midpoint between the current 4.5 million bushel quota and the minimum OY of 4 million bushels was chosen as an alternative ocean quahog quota which moves closer to the harvest level which industry actually utilized in 1998, but moderates the adjustment to a 6% change rather than the full 12% decrease represented by the minimum OY level.

Alternative #4 represents a slight increase in the quota for each species (between 6 and 11 percent), and responds to a request for consideration put forth by several members of industry. The Council, at its March 2000 meeting passed a motion to consider this type of increase for surfclams, and this is the staff recommendation for surfclams.

6.2. Quotas for the Maine Ocean Quahog Fishery

Alternative 2001 Quotas for the Maine Quahog Fishery			
Alt. M1	50% of Max. Quota	50,000 Maine Bu.	50% Decrease
Alt. M2	1998 Harvest Level	72,466 Maine Bu.	28% Decrease
Alt. M3**	Max Allowable - Status Quo	100,000 Maine Bu.	No Change
** Council Recommendation			

Three alternative quotas are presented for the Maine ocean quahog fishery. Alternative M1 corresponds to a 50% reduction from the maximum allowable quota under the current management plan. Alternative M2 corresponds to the harvest level actually attained in 1998, though it would reduce the allowable harvest by 28%. Finally, Alternative M3 would maintain the status quo quota at the maximum allowable level of 100,000 Maine bushels.

The Council recommends that the Maine ocean quahog quota for 2001 remain unchanged at the initial maximum quota of 100,000 Maine bushels (1 bushel = 1.2445 cubic feet).

Staff believes that the 2000 quota will be reached in before the end of the year and the Regional Administrator will close the fishery in 2000. It is anticipated that the Regional Administrator will likely also have to close the fishery in 2001.

According to 50 CFR section 648.76 (2)(b)(iv): *The Regional Administrator will monitor the quota based on dealer reports and other available information and shall determine the date when the quota will be harvested. NMFS shall publish notification in the Federal Register advising the public that, effective upon a specific date, the Maine mahogany quahog quota has been harvested and notifying vessel and dealer permit holders that no Maine mahogany quahog quota is available for the remainder of the year.*

It must also be remembered that according to 50 CFR section 648.76 (2)(b)(iii): *All mahogany quahogs landed by vessels fishing in the Maine mahogany quahog zone for an individual allocation of quahogs*

under section 648,70 will be counted against the ocean quahog allocation for which the vessel is fishing.
In other words, even after the initial maximum quota of 100,000 Maine bushels is harvested from the Maine mahogany ocean quahog zone (north of 43°50'), vessels could obtain/use ITQ allocation and

continue to fish in this zone. It is anticipated that some Maine fishermen will rent ITQ allocation after the 100,000 bushel quota is reached.

Amendment 10 (MAFMC 1998) emphasized that there had been no comprehensive, systematic survey or assessment of the ocean quahog resource in eastern Maine. It also emphasized that a full stock assessment of the Maine resource should be a priority to ensure that this segment of the fishery would have a sustainable future. The initial maximum quota for the Maine zone was to remain in effect until a resource survey and assessment was completed. The agreement at the time of Amendment 10 was that the State of Maine was to initiate a survey once the initial maximum quota of 100,000 bushels became constraining. Such a survey has not yet been conducted.

6.3. Surfclam Size Limit Suspension

The Council recommends that the surfclam minimum size limit remain suspended in 2001. The minimum length for surfclams is 4.75 inches. According to 50 CFR section 648.72 (c): *Upon the recommendation of the MAFMC, the Regional Administrator may suspend annually, by publication in the Federal Register, the minimum shell-height standard, unless discard, catch, and survey data indicate that 30 percent of the surfclams are smaller than 4.75 inches (12.065 cm) and the overall reduced shell height is not attributable to beds where the growth of individual surfclams has been reduced because of density dependent factors.*

7. ANALYSIS OF ALTERNATIVES

The objective of this analysis is to describe clearly and concisely the economic effects of the various alternatives. The types of effects that should be considered include the following:

- Changes in net benefits within a benefit-cost framework.
- Changes in the distribution of benefits and costs among groups.
- Changes in income and employment in fishing communities.
- Cumulative impacts of regulations.

A more detailed description of the economic concepts involved can be found in "Guidelines for Economic Analysis of Fishery Management Actions" (USDC 2000), as only a brief summary of key concepts will be presented here.

Benefit-cost analysis is conducted to evaluate the net social benefit arising from changes in consumer and producer surpluses that are expected to occur upon implementation of a regulatory action. Total Consumer Surplus (CS) is the difference between the amounts consumers are willing to pay for products or services and the amounts they actually pay. Thus CS represents net benefits to consumers. When the information necessary to plot the supply and demand curves for a particular commodity is available, consumer surplus is represented by the area that is below the demand curve and above the market clearing price where the two curves intersect. Due to lack of an empirical model for these fisheries and knowledge of elasticities of supply and demand, a qualitative approach to the economic assessment was adopted. Nevertheless, quantitative measures are

provided whenever possible.

An evaluation of consumer surplus for surfclams and ocean quahogs is further complicated by the fact that there are few retail markets for either species outside of Maine. All of the landings from the ITQ fisheries are sold to processors who then add value by processing them into a variety of product forms. Boxes of frozen, breaded surfclam strips, cans of "clamato" juice, or chopped "clam meats" are the more common items that may be found on retail grocer's shelves. The majority of production is sold at the wholesale level to restaurants or other processors in the food industry that use them as ingredients in chowders and sauces.

Net benefit to producers is producer surplus (PS). Total PS is the difference between the amounts producers actually receive for providing goods and services and the economic cost producers bear to do so. Graphically, it is the area above the supply curve and below the market clearing price where supply and demand intersect. Economic costs are measured by the opportunity cost of all resources including the raw materials, physical and human capital used in the process of supplying these goods and services to consumers.

One of the more visible costs to society of fisheries regulation is that of enforcement. From a budgetary perspective, the cost of enforcement is equivalent to the total public expenditure devoted to enforcement. However, the economic cost of enforcement is measured by the opportunity cost of devoting resources to enforcement vis à vis some other public or private use and/or by the opportunity cost of diverting enforcement resources from one fishery to another.

7.1. Analysis of Surfclam Alternatives

Surfclam Quota Alternatives			
	Description	Quota (bushels)	% Change from 2000
Alt. S1	Min. Allowable	1.850 million	28% Decrease
Alt. S2	1998 Harvest Level	2.365 million	8% Decrease
Alt. S3	Status Quo	2.565 million	No Change
Alt. S4**	Slight Increase	2.850 million	11% Increase
Alt. S5	Max. Allowable	3.400 million	33% Increase
** Council Recommendation			

7.1.1. Baseline Alternative S3 - Status Quo Surfclam Quota - 2.565 million bushels

The baseline against which the surfclam quota alternatives will be compared is the status quo of 2.565 million bushels. This quota level has remained constant in the federal surfclam fishery for the six-year interval from 1995 through 2000.

7.1.2. Areas of Impact that Do Not Change Regardless of the Alternative

7.1.2.1. Harvest Costs

In specifying an annual quota for the federal surfclam fishery, the government is placing a cap on total removals from the resource located in federal waters. No companion regulations that would impact the type, quantity, or method of gear utilization in the fishery are in effect at this time. Adoption of ITQ management in the surfclam and ocean quahog fisheries has negated the need for most gear and effort regulations, which have the greatest impact on the efficiency and costs of harvest operations.

Allowing the industry to trade allocation among its members enables businesses to adjust capital, labor, and output to the levels that maximize profitability, and minimize costs.

The two remaining management tools in the FMP that have the potential to increase harvest costs directly are closed areas and the minimum size limit for surfclams. Closing nursery areas or creating "sanctuaries" to protect living resources and habitat in a specific area will typically oblige fishermen to limit their operations to areas which are less productive or more distant, thereby driving up costs.

Use of the surfclam minimum size restriction in the past has motivated vessels to install "sorters" which cull out smaller individuals and then route them back overboard. In addition to slowing the harvest process, sorters will add to the damage inflicted by dredging, resulting in substantial mortality to those small clams that are returned to the ocean.

Fortunately, recent assessment work has suggested that the overall health of the surfclam resource is substantially better than previously thought. This has allowed the Council to recommend a higher quota for 2001, and again forego the use of the two management tools which have the greatest negative side effects associated with them.

For these reasons, it is considered that none of the surfclam quota alternatives presented in this document will have the effect of significantly altering harvest costs.

7.1.2.2. Enforcement Costs

Adoption of ITQ management in the surfclam and ocean quahog fisheries has allowed enforcement officials to focus attention on a limited number of shoreside processing plants, as opposed to large expanses of the ocean to monitor effort restrictions. Instead of ensuring that vessels were operating only on their allowed fishing days, which required the use of expensive Coast Guard cutters and aircraft, enforcement officials can restrict their efforts to the accounting task of ensuring that all clam shipping containers bear an official government "tag." Once a tag is attached to a "cage" full of surfclams or ocean quahogs, it cannot be removed without destroying it. This prevents tags from being reused, and the annual quota from being exceeded.

Compliance with the regulations under the ITQ system is widely thought to be high. Perhaps the most significant reason for this is that the harvest rights represented by an allocation are valuable, and could be forfeit if repeated violations of the law are uncovered. This fact alone creates a situation where violators have much more to lose than gain by failing to place tags on a shipment of surfclams.

A second factor relates to the question of who is thought to be harmed by a violation. In a fishery managed as an open pool, violators may well feel they are only cheating "the government." In an ITQ managed fishery, the fishermen themselves are more highly vested in a fishery, and are more likely to view cheaters as stealing from themselves, rather than the government. Hence they are more likely to report violations they witness.

None of the management alternatives under consideration for surfclams would alter this enforcement dynamic, and therefore are not identified as leading to a change in enforcement costs.

7.1.3. Preferred Alternative S4 - Slight Increase in Surfclam Quota - 2.850 million bushels

7.1.3.1. Landings

Increasing the federal surfclam quota to 2.850 million bushels would correspond to an 11% increase in landings. Recent developments in the industry suggest that the market can now absorb an increase of this magnitude, as contrasted with 1997 and 1998 when there was a glut of unsold product being held in storage. Development on a new "superstrip" fried clam product has helped increase sales of surfclams to the restaurant trade in New England, New York and New Jersey. The increasing costs of harvesting ocean quahogs has led to substitution of surfclams for ocean quahogs, further expanding their market.

7.1.3.2. Exvessel Prices

Current exvessel prices reported in the clam vessel logbooks as of mid-September 2000 range from \$5.00 per bushel to \$12.75. It is presumed that the low-end reports between \$5.00 and \$8.00 do not include the value of the allocation cage tags, while those between \$10.00 and \$12.75 do include the allocation value. The most commonly reported upper-end price continues to be \$10.00, though there does seem to be some evidence supporting industry comments that the \$11.00 price point is becoming more common.

If the 11% increase in quota recommended by this alternative is adopted, it is likely to relieve any further upward pressure on exvessel prices. Hence it is expected that exvessel prices will remain unchanged in 2001 if this alternative is adopted.

7.1.3.3. Consumer Prices

With exvessel prices expected to remain stable under this alternative, no changes in consumer prices are anticipated. However, it must be emphasized that many food products include surfclams or ocean quahogs as a relatively minor ingredient. Retail prices of these products may be more sensitive to changes in the price of other inputs to the production process, such as potatoes or cream (for chowders), energy, or labor.

7.1.3.4. Consumer Surplus

Assuming the retail prices of surfclam products will not be affected under the scenario described above, there will be no corresponding change in consumer surplus.

7.1.3.5. Producer Surplus

Without knowledge of the elasticities of demand and supply in the surfclam market, it is difficult to predict changes in producer surplus with accuracy. Normally an increase in available supply in a competitive market would lead to downward pressure on exvessel prices. If some of the price reduction were passed on to retail consumers, this would generate an increase in consumer surplus, since consumers would be able to purchase more surfclam product at a lower price. The impact on producer surplus is less clear. The revenue that is generated from selling additional product might be offset by the necessity to sell surfclams at the lower price.

Given current market conditions, it is assumed that vessels will be able to hold on to the recent small increase in the price of surfclams, and that there will not be a price decrease in the near term as a result of an 11% increase in the quota. This would result in producers receiving most of the benefits from the quota increase, rather than consumers, and hence an expected increase in producer surplus if this alternative is adopted.

7.1.3.6. Distributive Impacts

Under the surfclam and ocean quahog ITQ system, members of the public have the ability to control their own share of the harvest. Quota for either species can be purchased or leased from other allocation holders. Distributive impacts from annual quota setting will not occur unless the quota is set above market needs. When surplus quota exists, it can be expected that allocation holders that are vertically integrated with a processor, or have a stronger relationship with a processor will be better positioned to sell their allocation. Those in a weaker position will be unable to sell some, or perhaps a majority of their allocation in a given year.

This does not appear to be the case in the federal surfclam fishery for the near term. Industry members have stated that they will be able to utilize the 11% increase proposed by this alternative in 2001.

7.1.3.7. Cumulative Impacts Across Time

Cumulative impacts may occur in the surfclam and ocean quahog fisheries if a quota surplus persists over a period of years. If an individual with lesser access to a market is unable to sell his/her annual allocation over an extended period of time, the financial pressure may ultimately force them to sell their allocation rights altogether and leave the industry.

This concern did exist in the federal surfclam fishery during 1997 and 1998, however it abated in 1999 and 2000 as demand for surfclams recovered. It is not anticipated that the 11% increase in surfclam quota proposed by this alternative will create a surplus in the near term.

7.1.3.8. Risk of Biological Overexploitation

The risk of biological overexploitation from an 11% increase in quota appears to be quite low. However, a qualitative comparison relative to the status quo baseline would have to find the risk slightly higher than if no increase were made at all.

A detailed evaluation is presented in the companion document: "Environmental Assessment and Essential Fish Habitat Assessment for the 2001 Surfclam and Ocean Quahog Fishing Quotas."

7.1.4. Alternative S1 - Minimum Allowable Surfclam Quota - 1.850 million bushels

7.1.4.1. Landings

Changing the surfclam quota to the minimum allowable under the existing management plan represents a 28% reduction in landings relative to the status quo.

7.1.4.2. Exvessel Prices

A 28% decrease in landings from federal waters would have a significant impact on the market, and would most certainly lead to an increase in exvessel prices.

7.1.4.3. Consumer Prices

It is likely that some of the increase in exvessel price will be passed along to consumers. Those products that contain a high proportion of surfclam meat, such as the new fried clam "superstrips," would probably increase the most. Chowders and soups would likely be less affected.

7.1.4.4. Consumer Surplus

The consumer price increases that would result from adoption of this alternative would lead to a decrease in consumer surplus.

7.1.4.5. Producer Surplus

The benefits to the harvesting sector of higher exvessel prices would be offset by the 28% decrease in federal surfclam harvests that could be sold. Whether a net increase or decrease in producer surplus would result depends on the magnitude of the exvessel price increase. In this analysis, it is assumed that the price increase would not fully compensate for the lost harvest opportunity, and result in a reduction in producer surplus.

7.1.4.6. Distributive Impacts

Given that a quota reduction would impact all allocation holders proportionally, it is not considered that this alternative would disproportionately advantage or disadvantage any particular sector.

7.1.4.7. Cumulative Impacts over Time

If the federal surfclam harvest were to be reduced by 28% and remain at that level for a number of years, it would likely represent a significant revenue loss for the industry as a whole. Likely impacts include increased harvests of alternative sources of meat, such as ocean quahogs and the lower-quality surfclams in New York inshore waters. Efforts to finalize the PSP testing protocol for Georges Bank would likely accelerate, in order to permit vessels to harvest surfclams and ocean quahogs from this area that is currently closed.

7.1.4.8. Risk of Biological Overexploitation

Given that the federal surfclam resource is thought to be healthy and underexploited at the current harvest level, the risk of biological overexploitation after a 28% reduction should be extremely low.

7.1.5. Alternative S2 - 1998 Harvest Level Surfclam Quota - 2.365 million bushels

7.1.5.1. Landings

Changing the surfclam quota to 2.365 million bushels in 2001 represents an 8% reduction in landings relative to the status quo.

7.1.5.2. Exvessel Prices

An 8% reduction in federal harvests of surfclams would likely lead to a modest increase in exvessel prices.

7.1.5.3. Consumer Prices

An 8% reduction in federal harvests of surfclams would likely lead to a slight increase in consumer prices. The most noticeable cases would be in those products which contain a high proportion of surfclam meat.

7.1.5.4. Consumer Surplus

The increase in consumer prices envisioned if this alternative is adopted would lead to a small decrease in consumer surplus.

7.1.5.5. Producer Surplus

The benefits to the harvesting sector of higher exvessel prices would be offset by the 8% decrease in federal surfclam harvests that could be sold. Whether a net increase or decrease in producer surplus would result depends on the magnitude of the exvessel price increase. In this analysis, it is assumed that the price increase would not fully compensate for the lost harvest opportunity, and result in a small reduction in producer surplus.

7.1.5.6. Distributive Impacts

Given that a quota reduction would impact all allocation holders proportionally, it is not considered that this alternative would disproportionately advantage or disadvantage any particular sector.

7.1.5.7. Cumulative Impacts Over Time

If the federal surfclam harvest were to be reduced by 8% and remain at that level for a number of years, it would likely have a moderate, negative impact on the industry. Exvessel prices would rise and greater use of alternative sources of clam meats would be made.

7.1.5.8. Risk of Biological Overexploitation

Reducing the federal surfclam quota by 8% should provide a slight reduction in the risk of biological overexploitation relative to the status quo.

7.1.6. Alternative S5 - Maximum Allowable Surfclam Quota - 3,400 million bushels

7.1.6.1. Landings

Increasing the federal surfclam quota to 3,400 million bushels would correspond to a 33% increase in landings. Whether the market could absorb such a large increase in one year is questionable, given the recent glut of clam meats that was experienced in 1997 and 1998. This analysis assumes that some portion of the quota increase will remain unharvested.

7.1.6.2. Exvessel Prices

A 33% increase in quota would have a significant impact on the market, and would most certainly lead to an decrease in exvessel prices.

7.1.6.3. Consumer Prices

It is possible that some of the decrease in exvessel price would be passed along to consumers. Those products that contain a high proportion of surfclam meat, such as the new fried clam "superstrips," would probably decrease the most.

7.1.6.4. Consumer Surplus

The consumer price decreases that would result from adoption of this alternative would lead to an increase in consumer surplus.

7.1.6.5. Producer Surplus

The changes in producer surplus that might occur from a large quota increase will depend on a particular firm's position in the industry, and the magnitude of price changes. The harvesting sector may experience an increase or decrease in producer surplus dependent on the magnitude of the decline in exvessel prices. The smaller the drop in prices, the greater the likelihood that the sector will come out ahead. The processing sector will generally benefit from a decrease in the exvessel prices they must pay to harvesters. However, they too may be pressured to lower their finished good prices once their customers discover that raw material prices have fallen.

7.1.6.6. Distributive Impacts

It is assumed that a surfclam quota increase of 33% would not be fully utilized in the first year of implementation. Therefore, there would be distributive impacts in the near term as those allocation holders that have lesser access to a market would be unable to sell all of their allocation before it expired at the end of the year.

7.1.6.7. Cumulative Impacts Over Time

Cumulative impacts may occur under this alternative if surplus quota were to persist over a period of years, and those businesses holding the unnecessary quota shares fail. It is not possible to predict whether such an eventuality would come to pass at this point in time.

7.1.6.8. Risk of Biological Overexploitation

This alternative presents the highest risk of biological overexploitation relative to the status quo. The nature of the risk is simply that recent assessment work may have overestimated the current stock size, making this maximum level of harvest unsustainable. The uncertainty will be reduced as results are borne out over time.

7.1.7. Summary of Surfclam Impacts

Summary of Impacts for Proposed 2001 Surfclam Quota Alternatives Relative to Status Quo Alt. S3: 2.565 million bushels				
Feature	Alt. S1 Min. Allowable 1.850 million bushels	Alt. S2 1998 Harvest Level 2.365 million bushels	Alt. S4 (Preferred) Slight Increase 2.850 million bushels	Alt. S5 Max. Allowable 3.400 million bushels
Landings	- 28%	- 8%	+ 11%	+ 33% (?)
Exvessel Prices	+	+	0	-
Consumer Prices	+	Slight +	0	-
Consumer Surplus	-	Slight -	0	+
Harvest Costs	0	0	0	0
Producer Surplus	-	Slight -	+	(?)
Enforcement Costs	0	0	0	0
Distributive Impacts	0	0	0	+
Cumulative Impacts	+	Slight +	0	+ (?)
Risk of Biological Overexploitation	-	Slight -	Slight +	Slight +
+ indicates an increase relative to the status quo; - indicates a decrease relative to the status quo; 0 indicates no change; ? indicates unknown				

The Mid-Atlantic Council and staff are recommending a moderate increase in the federal surfclam quota of 11% for the year 2001.

The principal justification for relaxing the harvest limit rests in the fact that recent research and developments in the fishery have been largely positive. Our most recent biological assessments (both in 1998 and 2000) have indicated that the resource is healthy, composed of many age classes, and can safely sustain increased harvests. Information reported by the industry in fishery logbooks have supported these findings by showing an increase in Landings Per Unit of Effort (LPUE), an important indicator of resource condition.

Utilization of the surfclam resource has also improved as demonstrated by the federal and New Jersey state quotas being fully harvested in 1999. The New York inshore quota remains underutilized, with roughly half of the 500,000 bushel quota left unharvested for the past two years. The surfclam beds in New York state waters suffer from the disadvantage of being smaller and of a lower quality than clams that are currently being fished elsewhere.

In sum, the principal reasons for not increasing the quota more than 11% are:

- 10% increase was put forth by industry as a compromise position.
- A large increase would likely further depress the quahog fishery.
- The New York inshore quota remains underutilized.
- The recent assessments represent new work that must still withstand the test of time.

7.2. Analysis of Ocean Quahog Alternatives

There are five alternative quota levels considered for the 2001 ocean quahog fishery:

Ocean Quahog Quota Alternatives			
Alt. Q1	Min. Allowable	4.000 million	12% Decrease
Alt. Q2	Partial Reduction	4.250 million	6% Decrease
Alt. Q3**	Status Quo	4.500 million	No Change
Alt. Q4	Slight Increase	4.75 million	6% Increase
Alt. Q5	Max. Allowable	6.000 million	33% Increase
** Council Recommendation			

Due to the fact that 2001 landings are not expected to reach even the minimum quota level of 4.0 million bushels, none of the alternatives are expected to have any impact on the following areas:

- Landings
- Exvessel prices
- Consumer prices
- Consumer surplus
- Harvest costs
- Producer surplus
- Enforcement costs
- Risk of biological overexploitation

7.2.1. Summary Evaluation of All Quahog Quota Alternatives

The picture we have of the ocean quahog fishery is quite different from that of the surfclam fishery. It has supported intense harvests for over two decades, and scientists believe that even when the closed portions of the resource are excluded, 82% of the virgin biomass remains untouched.

Yet the economic promise of the ocean quahog fishery does not look bright in the near term. Landings of ocean quahogs in 1999 totaled 3.77 million bushels, the lowest harvest in 15 years, and 16% below the 1999 quota of 4.5 million bushels. As described in prior sections, the ocean quahog resource is a low-value, bulk food commodity that must be harvested rapidly, and in large quantities in order to make a profit. Many of the densest beds, which are believed to have formed over a period of many decades, have been harvested, and the very slow-growing nature of these animals implies that they will not be replaced in our lifetime.

Fishermen have been finding it increasingly costly to harvest ocean quahogs, and have been dropping out of the fishery. When the ocean quahog fishery was initiated in 1976, it was largely in response to a shortage of available surfclam resource. Now that high-yielding surfclam beds are plentiful and can be found much closer to shore than ocean quahogs, surfclams have been increasingly used to fill ocean quahog orders. Harvest rates in the current year 2000 have been similar to 1999, with a projected quota surplus on the order of 17%. With the Council recommending an increase in the surfclam quota for 2001, and likely further increases in the following years, there is no reason to expect that the ocean quahog harvest level will rise above the 3.8 million bushel mark in 2001.

The three factors that have the greatest potential of changing the economic outlook for ocean quahogs are:

- 1) Harvest technology could improve and reduce the costs of fishing on the remaining, leaner quahog beds;
- 2) The price and availability of substitutes (i.e. surfclams) could change such that ocean quahogs become more attractive again;
- 3) Processors develop (new) ocean quahog products that can command a higher price in the marketplace, and hence allow fishermen to be paid higher prices for their catches.

Until such time as one or more of these factors change in favor of ocean quahogs, it is not expected that any of the ocean quahog quota alternatives that are currently allowed under the Fishery Management Plan would be reached. The impacts of selecting any particular quota level for 2001 then devolve to the distributive and cumulative impacts which may arise from surplus quota.

7.2.1.1. Distributive and Cumulative Impacts

The selection of an ocean quahog quota for 2001 ultimately results in a tradeoff between two competing risks:

- 1) The risk of setting the quota too low and (unnecessarily) restraining harvests without offsetting benefits;
- 2) The risk of setting the quota so high that a large surplus is generated, and causes economic harm to those entities that are unable to sell their quota shares for that year.

Quota shares in the ITQ fisheries for surfclams and ocean quahogs are held by large corporations as well as small, independent fishermen. One concern is that in years when the market is unable to absorb all of the quota set by the government, the revenue losses from unsold quota will fall disproportionately on independent fishermen with lesser access to a market. If these losses fall repeatedly on the same individuals over a period of years, they may be forced to cease operations. Alternatively, if the

profitability of ocean quahog harvests should unexpectedly improve in the short run, and the quota is set below market needs, profits will be foregone needlessly.

The issue may also be characterized as a decision on how large a quota surplus or "buffer" should be allowed to grow over time in the ocean quahog fishery. The Council and staff are recommending maintaining the 2000 quota of 4.500 million bushels for the ocean quahog fishery in federal waters apart from Maine for 2001. Assuming that current harvest rates do not change significantly, this would provide a buffer on the order of 15-17%. As market and resource conditions further reveal themselves in the future, it is recommended that quota adjustments be made to moderate the risks in either direction.

7.2.2. Summary of Ocean Quahog Impacts

Summary of Impacts for Proposed 2001 Ocean Quahog Quota Alternatives Relative to Status Quo Alt Q3: 4.500 million bushels (Preferred)				
Feature	Alt. Q1 Min. Allowable 4.000 million bushels	Alt. Q2 Slight Decrease 4.250 million bushels	Alt. Q4 Slight Increase 4.750 million bushels	Alt. Q5 Max. Allowable 6.000 million bushels
Landings	- 12% allowed (less than 4 mill. expected)	- 6% allowed (less than 4 mill. expected)	+ 6% allowed (less than 4 mill. expected)	+ 33% allowed (less than 4 mill. expected)
Exvessel Prices	0	0	0	0
Consumer Prices	0	0	0	0
Consumer Surplus	0	0	0	0
Harvest Costs	0	0	0	0
Producer Surplus	0	0	0	0
Enforcement Costs	0	0	0	0
Distributive Impacts	-	-	+	+
Cumulative Impacts	-	-	+	+
Risk of Biological Overexploitation	0	0	0	0
+ indicates an increase relative to the status quo; - indicates a decrease relative to the status quo; 0 indicates no change; ? indicates unknown				

7.2.3. Maine Ocean Quahog Fishery Quota

7.2.3.1. Preferred Alternative M3 - Max Allowable - 100,000 Maine Bu. (Status Quo)

The Council voted to recommend that the Maine ocean quahog quota remain unchanged for 2001 at the initial maximum quota level of 100,000 bushels. This quota pertains to the zone of both state and federal waters off the eastern coast of Maine north of 43 degrees 50 minutes north latitude. Amendment 10 established management measures for this small artisanal fishery in May of 1998, and specified an initial maximum quota of 100,000 bushels. This same level was continued again in 1999. Representatives of Maine all encouraged the Council to

maintain that quota for 2001 as well. Issues of under-reporting of the catches have improved since the fall of 1998, when Maine sent letters to all their permit holders explaining the need to report their landing to NMFS. It is hoped that the efforts of ACCSP (Atlantic Coastal Cooperative Statistics Program) will also help improve any misreporting of data.

Landings statistics for the Maine ocean quahog fishery totaled 94,000 Maine bushels in 1999. Preliminary landing statistics as of August 31, 2000 indicated that 82% of the Maine ocean quahog quota had been harvested, while 67% of the year had passed by. Landings tend to taper off after the Labor Day holiday weekend, however it is possible that a 100,000 bushel quota could be reached in 2000 and 2001. If fishermen wish to continue harvesting after this quota is reached, they must purchase allocation from the ITQ portion of the ocean quahog fishery. Adoption of this "maximum allowable" quota alternative would minimize the amount of ITQ purchases that might be necessary from the other portion of the fishery.

Specification of a sustainable harvest limit for the Maine fishery remains problematic for two principal reasons. First and foremost, a survey and assessment of the resource off Maine has never been conducted. The shallow depths involved have inhibited the use of NMFS' standard survey vessel, and the small size of the fishery has made justification of additional funds difficult. Nevertheless, the Council continues to recommend that a survey and assessment be conducted as soon as funding is available.

The second issue involves public safety closures for PSP toxin. Due to the health risks associated with toxins that may appear in a number of shellfish species on this portion of the coast, Maine officials only allow fishing to occur in those areas that are being actively monitored. Other areas may contain ocean quahogs, but remain unavailable to fishermen due to the lack of sampling coverage. This raises the question as to whether a sustainable harvest limit should pertain to only those areas that are typically open to fishing, or to the entire Maine ocean quahog fishery zone above 43° 50'.

In any regard, available information from fishermen and researchers in Maine suggest that the fishery is currently not in danger of depletion, and would not be adversely impacted through continuation of the maximum 100,000 bushel quota for 2001.

7.2.3.2. Alternative M1 - 50% of Maximum Quota - 50,000 Maine Bu.

7.2.3.2.1. Landings

Reducing the Maine ocean quahog quota to 50% of the maximum allowable under the existing management plan represents a 50% reduction in potential landings versus the status quo. However, it is assumed that once the "free" quota assigned to the Maine fishery is harvested, fishermen would simply rent surplus ocean quahog quota from the ITQ fishery to replace it.

Current projections indicate that more than 900,000 bushels of quahogs from the ITQ fishery will be left unharvested in 2000. If the trend to substitute surfclams for ocean quahogs continues, the surplus may be even greater in 2001. For the purposes of this analysis, it is assumed that the rental price will be \$0.75 per bushel in mid-2001, as compared to \$1.00 per bushel in mid-2000.

It is further assumed that if the 2001 Maine quota were reduced by 50,000 bushels, that 100% of that reduction

would be replaced by rented allocation from the ITQ fishery.

7.2.3.2.2. Exvessel Prices

A reduction in the "free" quota available to Maine quahog fishermen will oblige them to replace it with rented quota from the ITQ fishery. Rented quota, therefore, will simply become an additional variable cost of harvest operations.

Without knowledge of the elasticities of demand and supply in the fresh, half-shell market, it is difficult to predict changes in exvessel prices. However, a 50% reduction in the Maine quota would be a significant event for the Maine fishery, given that virtually all of the 100,000 bushel quota is now being utilized. The Maine quota would likely be exhausted in mid-year, when most of the Maine vessels are still participating in the fishery. Most of the vessels, therefore, would be obliged to rent quota from the ITQ fishery. The additional \$0.75 per bushel cost would be minimal considering the much higher value which Maine quahogs command, when compared to landings from the ITQ fishery. The average exvessel price for Maine ocean quahogs was \$27.55 per Maine bushel in 1999, compared with \$4.25 per bushel in the ITQ fishery.

Note that a Maine bushel is smaller than a bushel in the ITQ fishery, so an adjusted price for Maine ocean quahogs would be an even higher \$41.62 per ITQ bushel. (1 Maine bushel = 1.2445 cubic feet; 1 ITQ bushel = 1.88 cubic feet.)

It is expected that Maine fishermen would be able to pass along a portion of their increased costs from renting quota, resulting in a slightly higher exvessel price for Maine ocean quahogs.

7.2.3.2.3. Consumer Prices

With exvessel prices expected to increase slightly under this alternative, prices to consumers may increase very slightly.

7.2.3.2.4. Consumer Surplus

Assuming that consumers would pay a slightly higher retail price for Maine ocean quahogs, consumer surplus would decrease slightly.

7.2.3.2.5. Harvest Costs

After the free Maine ocean quahog quota is exhausted, fishermen are expected to rent quota from the ITQ fishery. The cost per ITQ bushel is estimated at \$0.75. Assuming that the entire quota reduction of 50,000 bushels is replaced, the increased harvesting costs would equal \$37,500 across all vessels.

There are two factors which would serve to adjust this amount. First is the fact that Maine bushels are smaller than ITQ bushels, which would lower rental costs since fewer ITQ bushels would be needed to land each Maine ocean quahog bushel. One cage tag allows for the landing of 32 ITQ bushels (1.88 cu. ft. each), whereas one tag would equate to 48 Maine bushels (1.2445 cu. ft. each).

The second factor involves the fact that 1 cage tag is the smallest quota unit that a fishermen can utilize when landing either surfclams or ocean quahogs in the ITQ fishery. For most Maine ocean quahog trips, this unit is relatively efficient, since in 1999 the average catch per trip was 47 Maine bushels. Each trip would then require 1 tag to cover 48 Maine bushels, at an estimated cost of \$24.00.

Inefficiencies would exist in those cases where either fewer or larger harvests were made on a single trip. Landings of any quantity between 1 and 48 Maine bushels would require one cage tag to be used. Similarly, landings of any quantity between 49 and 96 Maine bushels would require two tags be used.

For the purposes of this analysis, it is assumed that these two countervailing factors will balance one another out, and that the overall increase in harvest costs under this alternative is \$37,500.

7.2.3.2.6. Producer Surplus

It is expected that producers (vessels) will be obliged to absorb a portion of the increased costs of harvest that would result from renting ITQ quota. Producer surplus would correspondingly decrease slightly.

7.2.3.2.7. Enforcement Costs

With the widespread use of ITQ quota in Maine that this alternative envisions, the costs of tracking and enforcing it would increase. Since the implementation of Amendment 10 in May 1998, it has not been necessary to track ITQ in Maine because the 100,000 bushel quota in effect since that date was sufficient for the fishery's needs.

7.2.3.2.8. Distributive Impacts

No significant distributive impacts are foreseen from adoption of this alternative.

7.2.3.2.9. Cumulative Impacts

No significant cumulative impacts are foreseen from adoption of this alternative.

7.2.3.2.10. Risk of Biological Overexploitation

The risk of localized overexploitation exists in all of the management alternatives currently available for the Maine ocean quahog fishery. From a coast-wide perspective, there is little risk to the ocean quahog resource from the total allowable harvest of the combined ITQ and Maine ocean quahog quotas.

However, the lack of a survey and assessment of the Maine ocean quahog fishery zone leaves the question of a sustainable harvest level for this area unresolved. It is hoped that the State of Maine will be able to fund such an assessment in the near future, and that, in cooperation with the federal government, any necessary adjustments to the management regime be considered to ensure the continued health of the Maine fishery.

7.2.3.3. Alternative M2 - 1998 Harvest Level - 72,466 Maine Bu.

7.2.3.3.1. Landings

Reducing the Maine quahog quota to the 1998 harvest level of 72,466 Maine bushels represents a 28% reduction in potential landings versus the status quo. However, it is again assumed that once the "free" quota assigned to the Maine fishery is harvested, fishermen would simply rent surplus ocean quahog quota from the ITQ fishery to replace it. Total landings, then, would remain unchanged from the status quo alternative.

7.2.3.3.2. Exvessel Prices

Given the landings pattern exhibited in 1999, a quota of 72,466 Maine bushels should sustain the fishery through the Labor Day holiday in early September. This would limit the additional costs of renting ITQ to only those vessels active in the final few months of the year. As with the prior alternative, it is expected that vessels will be able to recoup a portion of the added costs through slightly higher exvessel prices.

7.2.3.3.3. Consumer Prices

The magnitude of the increase in exvessel prices under this alternative is considered to be so small that it is unlikely to have a discernable impact on consumer prices.

7.2.3.3.4. Consumer Surplus

With consumer prices expected to remain constant under this alternative, no changes in consumer surplus would result.

7.2.3.3.5. Harvest Costs

It is expected that vessels would respond to a 28% decrease in the Maine quota by renting the 27,534 bushels lost from the ITQ portion of the fishery. At an estimated cost of \$0.75 per bushel, this would result in an increase of \$20,650 in harvest costs across all vessels. (See the section on harvest costs in the prior alternative for a discussion of other compensating factors affecting the use of ITQ quota in the Maine fishery.)

7.2.3.3.6. Producer Surplus

It is expected that producers (vessels) will be obliged to absorb a portion of the increased costs of harvest that would result from renting ITQ quota. Producer surplus would correspondingly decrease slightly.

7.2.3.3.7. Enforcement Costs

With the need to administer and track the use of ITQ quota in the Maine fishery, enforcement costs would increase. However, with utilization limited to only those vessels remaining active in the final months of the year, the costs would be less than those resulting from the prior (50% of Maximum Quota) alternative.

7.2.3.3.8. Distributive Impacts

No significant distributive impacts are foreseen from adoption of this alternative.

7.2.3.3.9. Cumulative Impacts

No significant cumulative impacts are foreseen from adoption of this alternative.

7.2.3.3.10. Risk of Biological Overexploitation

As discussed in the prior alternative, the risk of biological overexploitation is expected to be similar across all quota alternatives currently available for the Maine ocean quahog fishery.

7.2.3.4. Summary of Maine Ocean Quahog Quota Impacts

Summary of Impacts for Proposed 2001 Maine Ocean Quahog Quota Alternatives Relative to Status Quo Alt M3: 100,000 Maine bushels (Preferred)		
Feature	Alt. M1 50% of Maximum Quota 50,000 Maine bushels	Alt. M2 1998 Harvest Level 72,466 Maine bushels
Landings	0 (assumes 50,000 Maine bushels will be leased from ITQ portion of the fishery)	0 (assumes that 27,534 Maine bushels will be leased from ITQ portion of the fishery)
Exvessel Prices	Slight +	Very Slight +
Consumer Prices	Slight +	0
Consumer Surplus	Slight -	0
Harvest Costs	+ \$37,500	+ \$20,650
Producer Surplus	Slight -	Slight -
Enforcement Costs	+	+
Distributive Impacts	0	0
Cumulative Impacts	0	0
Risk of Biological Overexploitation	0	0
+ indicates an increase relative to the status quo; - indicates a decrease relative to the status quo; 0 indicates no change; ? indicates unknown		

7.3. Other Management Actions: Suspend Minimum Size Restriction on Surfclams for 2001

The Surfclam and Ocean Quahog FMP includes a provision for a minimum size limit of 4.75 inches on surfclams, which may be used to protect new year classes from harvest before they have reached an optimal size. The provision is written such that a minimum size will automatically be in effect unless the Council takes the active step of suspending it each year.

The current stock is comprised primarily of large, adult individuals, with few small individuals apparent from landings in most areas. Reinstating a minimum size under these conditions would result in greater harm than benefit, as it would require the industry to use "sorting" machines which will often damage undersized clams as it routes them back overboard.

It is, therefore, the Council's recommendation that the surfclam minimum size limit be suspended for 2001, as has been done since 1990. Continuing the suspension will have no impact on the current fishery.

7.3.1. The Alternative of Not Suspending the Surfclam Minimum Size Limit in 2001

There is only one alternative to suspending the surfclam minimum size limit for 2001, and that is allowing the size limit to take effect. Each year the Council must take the active step of suspension, or a minimum size of 4.75 inches will automatically go into effect as of January 1. The current regulations read as follows:

§ 648.72 Minimum surf clam size.

(a) Minimum length. The minimum length for surf clams is 4.75 inches (12.065 cm).

(b) Determination of compliance. No more than 50 surf clams in any cage may be less than 4.75 inches (12.065 cm) in length. If more than 50 surf clams in any inspected cage of surf clams are less than 4.75 inches (12.065 cm) in length, all cages landed by the same vessel from the same trip are deemed to be in violation of the minimum size restriction.

(c) Suspension. Upon the recommendation of the MAFMC, the Regional Administrator may suspend annually, by publication in the Federal Register, the minimum shell-height standard, unless discard, catch, and survey data indicate that 30 percent of the surf clams are smaller than 4.75 inches (12.065 cm) and the overall reduced shell height is not attributable to beds where the growth of individual surf clams has been reduced because of density dependent factors.

(d) Measurement. Length is measured at the longest dimension of the surf clam shell.

The minimum size provision for the surfclam fishery is a measure that is most appropriate when a large proportion of the resource is comprised of smaller, younger surfclams. Its application can help ensure the continued viability of a young, or recovering resource by delaying their harvest until they have had multiple opportunities to spawn. It is also intended to improve the overall meat yield from a fishery by postponing harvest until after the rapid growth phase which occurs in the adolescence of most species.

The condition of having a large portion of the resource in an immature state occurred in the surfclam fishery following the anoxia event in the summer of 1976. Low levels of dissolved oxygen in the water off the coast of New Jersey killed large portions of the surfclam resource available at the time. In the subsequent years the Mid-Atlantic Council implemented a series of management measures for surfclams. These included quarterly harvest quotas, a moratorium on new vessels entering the fishery, effort limitations, reporting requirements, closed areas, and an initial minimum size limit of 5.5 inches.

Unfortunately, in addition to the desired effect, each of these measures also produced some negative side effects. Quarterly quotas that were shared among all vessels still motivated a race to fish as vessels sought to harvest as much as possible before the quota was reached and the fishery closed. The vessel moratorium made the replacement of ageing vessels difficult and contentious. Effort limitations which limited the amount of time a vessel could operate were expensive to enforce and costly to vessel owners in the forced down-time of their vessels. Closed nursery areas were very expensive to enforce because they required the use of Coast Guard cutters or surveillance aircraft, and it is considered likely that the stunting of the surfclam resource off Chincoteague, Virginia was contributed to by the area closure.

Minimum size limits are also subject to their share of unintended consequences. The minimum size for surfclams was generally favored by processors because it obliged fishermen to bring them the most profitable, high-yielding clams. However, vessel owners were subject to fines if their catches were found to be in violation, and resource benefits are muted when captains are unable to avoid small individuals, and are forced to discard them.

The culling out of small clams is most often accomplished with sorting machines, which will direct clams across a series of parallel metal rollers, allowing the smaller individuals to fall between the rollers and be

shunted back overboard. Fracture of the clam shell during this process is common, and a significant portion of the animals returned to the ocean will not survive.

In the 1999 surfclam logbook data, the average reported discard rate was 2%, and the highest reported rate was 11%. In the last assessment, gear mortality was assumed to be 10% of landings (animals killed from the dredge passing over them), and discard mortality an additional 10% of landings. Numbers of this magnitude are not suggestive of a population dominated by small individuals. Moreover, assessment figures continue to indicate that the stock is comprised primarily of large, adult individuals. Reinstating a minimum size under these conditions would result in greater harm than benefit, because it would result in higher discard mortality through the expanded use of sorters, as vessel owners seek to minimize the risk of fines.

It is, therefore, the Council's recommendation that the surfclam minimum size limit be suspended for 2001, as has been done since 1990. Continuing the suspension will provide substantial benefits through maintaining a low discard mortality rate, while giving up little in the way of increased survival of juveniles.

8. DETERMINATION OF A SIGNIFICANT REGULATORY ACTION

The proposed action does not constitute a significant regulatory action under Executive Order 12866 for the following reasons: (1) It will not have an annual effect on the economy of more than \$100 million. Based on federal logbook reports, the total value of the EEZ surfclam fishery was \$21.3 million in 1999, and the total value of the EEZ ocean quahog fishery was \$18.5 million. Hence, with a total value of \$39.8 million between the two fisheries, it is not possible for any regulation which the federal government might issue to exceed the \$100 million impact threshold. The proposed actions are necessary to maintain the harvest of surfclams and ocean quahogs at sustainable levels. The proposed action benefits in a material way the economy, productivity, competition and jobs. The proposed action will not adversely affect, in the long-term, competition, jobs, the environment, public health or safety, or state, local, or tribal government communities. (2) The proposed actions will not create a serious inconsistency or otherwise interfere with an action taken or planned by another agency. No other agency has indicated that it plans an action that will affect the Atlantic surfclam or ocean quahog fisheries in the EEZ. (3) The proposed actions will not materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of their participants. (4) The proposed actions do not raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this Executive Order.

8.1 Conclusion

Due to the lack of meeting any of the four criteria described above, it is determined that the proposed 2001 quotas for the surfclam and ocean quahog fisheries do not constitute a "significant" regulatory action.

9. REVIEW OF IMPACTS RELATIVE TO THE REGULATORY FLEXIBILITY ACT (Small Entity Impacts)

9.1. Introduction

The purpose of the Regulatory Flexibility Act (RFA) is to minimize the adverse impacts from burdensome regulations and record keeping requirements on small businesses, small organizations, and small government entities. The category of small entities likely to be affected by the proposed plan is that of commercial Atlantic surfclam and ocean quahog fishermen. The impacts of the proposed action on the fishing industry and the economy as a whole were discussed above. The following discussion of impacts centers specifically on the effects of the proposed actions on the mentioned small businesses entities.

9.2. Determination of Significant Economic Impact on a Substantial Number of Small Entities

The Small Business Administration (SBA) defines a small business in the commercial fishing sector as a firm with receipts (gross revenues) of up to \$3.0 million. The Northeast Regional Office of the National Marine Fisheries Service maintains current ownership records of surfclam and ocean quahog allocation holders. Tables 1 and 2 contain listings of ocean quahog and surfclam allocation holders respectively as of September 26, 2000. These are the entities that will be most directly impacted by the setting of annual quotas.

Table 1. Ocean Quahog Allocation Owners as of Sept. 26, 2000			
No. of Allocation Holders	State	Total Bushels Held	Bu/Holder
41	NJ	2,101,600	51,259
8	MD	29,1520	36,440
7	VA	913,824	130,546
5	VAR*	1,184,768	236,954
4	NY	7,616	1,904
Total = 65		4,499,328	69,220
*Var = CT, GA, FL, RI			

Table 2. Surfclam Allocation Owners as of Sept. 26, 2000			
No. of Allocation Holders	State	Total Bushels Held	Bu/Holder
66	NJ	1,119,008	16,955
17	VA	922,592	54,270
13	MD	413,568	24,328
10	VAR*	110,112	11,011

Total = 106		2,565,280	24,201
* Var = FL, MA, NY, RI			

Table 3 lists the number of vessels active in harvesting surfclams and ocean quahogs in the non-Maine fisheries. Some of these vessels may not hold allocations. Depending on the regulations promulgated, the population affected by the regulation may change, i.e. if, for example, an area is closed, both holders and service providing vessels may be affected, while with a quota change, only holders may appropriately be affected and service providers impacted.

Table 3. Vessel Participation in Surfclam and non-Maine Ocean Quahog Fisheries	
Species Harvested	Number of Vessels
Surfclams only	22
Ocean Quahogs only	12
BOTH Surfclams and Ocean Quahogs	11
TOTAL	45

Average 1999 gross income for surfclam vessels was \$ 646,701 per vessel, and for ocean quahogs was \$ 691,316 per vessel. In the small artisanal fishery for ocean quahogs in Maine, 38 vessels reported harvests in the clam logbooks, with an average value of \$68,097 per boat. All of these vessels readily fall within the definition of small businesses.

9.3. Analysis of Economic Impacts

9.3.1. Does this action result in revenue loss of >5% for > 20% of the participants?

9.3.1.1. *Atlantic Surfclam Quota*

The Mid-Atlantic Council is recommending an increase of 11% in the 2001 quota for surfclams in federal waters. Hence, if the quota is fully harvested and prices remain stable, an increase in revenue of 11% per vessel should result.

9.3.1.2. *Ocean Quahog Quota*

The Mid-Atlantic Council is recommending no change in the 2001 quota for ocean quahogs in federal waters. Maintaining the quota at its current level will not directly reduce the exvessel revenues of any industry participant.

9.3.1.3. *Maine Ocean Quahog Management Area*

The Mid-Atlantic Council is recommending no change in the 2001 quota for the Maine ocean quahog management area. Currently set at 100,000 bushels, 6% of the 1999 quota was left unharvested. Maintaining the quota at its current level will not directly reduce the exvessel revenues of any industry participant.

9.3.1.4. Suspension of Surfclam Minimum Size Limit

The Mid-Atlantic Council is recommending the continued suspension of the surfclam minimum size limit for 2001. This action should increase the profitability of participating in the surfclam fishery for all vessels, as it eliminates the need to purchase and maintain costly sorting machinery. As discussed in prior sections, the imposition of a size limit in the surfclam fishery is only advisable when the resource is comprised of predominantly small, juvenile individuals.

9.3.2. Does this action result in an increase in compliance costs (annualized capital, operating, reporting, etc.) of >5% for > 20% of the participants?

9.3.2.1. Atlantic Surfclam Quota

The costs of compliance with these regulations remain unchanged from prior years. Therefore, there should be no increase in compliance costs resulting from the recommended 2001 surfclam quota.

9.3.2.2. Ocean Quahog Quota

The costs of compliance with these regulations remain unchanged from prior years. Therefore, there should be no increase in compliance costs resulting from the recommended 2001 ocean quahog quota.

9.3.2.3. Maine Ocean Quahog Management Area

The costs of compliance with these regulations remain unchanged from prior years. Therefore, there should be no increase in compliance costs resulting from the recommended 2001 Maine ocean quahog area quota.

9.3.2.4. Suspension of Surfclam Minimum Size Limit

The costs of compliance with these regulations remain unchanged from prior years. Therefore, there should be no increase in compliance costs resulting from the recommended 2001 suspension of the surfclam minimum size limit.

9.3.3. Does this action result in 2% of the entities ceasing operations?

9.3.3.1. Atlantic Surfclam Quota

The Mid-Atlantic Council is recommending an increase of 11% in the 2001 quota for surfclams in federal waters. The market for surfclams is currently strong, and there should be no impediment to all vessels increasing their sales by a corresponding 11%. Hence, no business failures are expected as a result of this quota specification.

9.3.3.2. Ocean Quahogs Quota

The Mid-Atlantic Council is recommending no change in the 2001 quota for ocean quahogs in federal waters. There is currently a 16% surplus of unharvested ocean quahog quota. This is a result of the increasing costs of harvesting ocean quahogs, and the decreasing costs of substitute products (surfclams). A risk of business failure exists if selected allocation owners with lesser access to a market were unable to sell their quota shares over a period of years. Currently, there are no known cases of this occurring in the ocean quahog fishery. However, the Council is monitoring developments in the fishery closely, and will recommend adjustments in the future should the risk of business failure appear to increase.

9.3.3.3. Maine Ocean Quahog Management Area

The Mid-Atlantic Council is recommending no change in the 2001 quota for the Maine ocean quahog management area. It is not anticipated that this action will negatively impact the number of business entities.

9.3.3.4. Suspension of the Surfclam Minimum Size Limit

It is not anticipated that the suspension of the surfclam minimum size limit will have anything other than a favorable impact on the number of business entities.

9.3.4. 2001 Surfclam Quota Deemed "Not Significant" Impact

The Mid-Atlantic Council is recommending an increase of 11% in the 2001 quota for surfclams in federal waters. The market for surfclams is currently strong, and there should be no impediment to all vessels increasing their sales by a corresponding 11%. Therefore, with only positive impacts resulting from this action, it is concluded the 2001 surfclam quota will have no significant negative impact on small businesses.

9.3.5. 2001 Ocean Quahog Quota Deemed "Not Significant" Impact

The Mid-Atlantic Council has recommended "no change" in the ocean quahog quota for 2001. The industry is currently not utilizing all of the existing quota for ocean quahogs. Therefore, it is concluded that there will be no significant negative impact on small businesses.

9.3.6. 2001 Maine Ocean Quahog Area Quota Deemed "Not Significant" Impact

The Mid-Atlantic Council has recommended "no change" in the Maine ocean quahog area quota for 2001. Therefore, it is concluded that there will be no significant negative impact on small businesses.

9.3.7. Indirect Impacts

A required component for preparation of this analysis under the Regulatory Flexibility Act is identification of the industries and economic sectors that will either be directly or indirectly affected by the proposed regulation. In addition to commercial fishing vessels, this information is specifically provided for the affected economic sectors for the commercial fishing industry in the following Table 4.

Table 4. List of indirectly affected industry sectors

Commercial Fishing (0910)			Processors (2092)		
Sector	SIC Code	Impact Percent	Sector	SIC Code	Impact Percent
LUBRICATING OILS AND GREASES	2992	22.88%	COMMERCIAL FISHING	910	36.03%
CORDAGE AND TWINE	2298	11.84%	BUILDING MATERIALS AND GARDENING SUPPLIES	5200	18.07%
SHIP BUILDING AND REPAIRING	3731	11.72%	PREPARED FRESH OR FROZEN FISH OR SEAFOOD	2092	15.12%
MISCELLANEOUS REPAIR SHOPS	7690	6.53%	MISCELLANEOUS LIVESTOCK	0191, 0219, 0259, 0271, 0272, 0273, 0279, 0291	9.30%
MANUFACTURED ICE	2097	5.55%	WATER TRANSPORTATION	4400	6.05%
PETROLEUM REFINING	2910	4.76%	PAPERBOARD CONTAINERS AND BOXES	2650	4.03%
BOAT BUILDING AND REPAIRING	3732	4.23%	COMMUNICATIONS, EXCEPT RADIO AND TELEVISION	4810, 4820, 4849, 4890	2.36%
INSURANCE CARRIERS	6300	3.53%	GAS PRODUCTION AND DISTRIBUTION	4920, 4930	1.36%
AUTOMOBILE RENTAL AND LEASING	7510	2.24%			92.32%
WATER TRANSPORTATION	4400	2.05%			
	1500, 1600, 1700				
MAINTENANCE AND REPAIR OTHER FACILITIES	1700	1.96%			
CANVAS PRODUCTS	2394	1.61%			
	4200, 4789				
MOTOR FREIGHT TRANSPORT AND WAREHOUSING	4789	1.41%			
BANKING	6000	1.33%			
HOTELS AND LODGING PLACES	7000	1.16%			
MANAGEMENT AND CONSULTING SERVICES	8740	1.11%			
COMMERCIAL FISHING	910	1.04%			
AUTOMOTIVE DEALERS & SERVICE STATIONS	5500	1.03%			
HARDWARE, N.E.C.	3429	0.95%			
AUTOMOBILE REPAIR AND SERVICES	7530	0.92%			
INTERNAL COMBUSTION ENGINES, N.E.C.	3519	0.86%			
MANIFOLD BUSINESS FORMS	2760	0.77%			
BUSINESS ASSOCIATIONS	8610	0.62%			
		90.10%			

For the commercial sector, the proposed regulations will have direct effects on both commercial fishing and processing. These sectors are identified by their 4-digit Standard Industrial Classification (SIC) code as 0910 and 2092 respectively. The economic sectors that will be indirectly affected were identified in the following manner: An Input/Output model of the United States economy was estimated using a PC-Based software program called IMPLAN. IMPLAN has been in use since its development by the U.S. Forest Service in 1979. IMPLAN is based on Bureau of Economic Analysis (BEA) data for 521 industries. The U.S. model provides information on linkages among industries as well as an estimate of the required amount of purchases from all sectors in order to produce one dollar's worth of output in a given sector. The indirectly affected economic sectors for commercial fishing and processing were listed in Table 1, along with the SIC codes that comprise those sectors. Note that the list of sectors is not exhaustive, but include sectors in descending order of impact and only reports those sectors whose cumulative impact was 90 percent or greater.

In each column of Table 1, headed by the title "Impact Percent" are estimated proportions of expenditures by directly affected sectors on purchased inputs (i.e. expenses per dollar of commercial fishing output net of value added) from each of the indirectly affected sectors. For example, of the inputs used by commercial vessels, 22.88 percent were from SIC sector 2992 (lubricating oils and greases). Value added includes payments that go to labor (captain and crew) and profits. This means that for every dollar spent to produce a dollar's worth of commercial fishing \$0.75 goes to value added and \$0.25 goes to purchased inputs other than labor. Thus, the effect on indirectly affected industries is the product of \$0.25 and the "Impact Percent." Sector 2992 has the highest impact percent (22.88) and revenues in that sector would change at a rate of \$0.057 per dollar of output change in the commercial fishing sector. Since no significant impact (>5%) was found for either the surfclam or ocean quahog fishery, it is very unlikely that the any indirectly affected firms would be significantly impacted by any of the three criterion.

9.4. Explanation of Why The Action is Being Considered

Regulations implementing the Fishery Management Plan (FMP) for the Atlantic Surfclam and Ocean Quahog Fisheries prepared by the Council appear in 50 CFR Subpart E Sec. 648.7. These regulations stipulate that prior to the beginning of each year, the MAFMC, following an opportunity for public comment, will recommend to the Assistant Administrator quotas and estimates of DAH and DAP for surfclams and ocean quahogs within the ranges specified.

9.5. Objectives and Legal Basis for the Rule

Refer to the section on Management Objectives above (Section 1.2). The Magnuson-Stevens Fishery Conservation and Management Act (Public Law 94-265) as amended through October 11, 1996 provides the legal basis for the rule.

9.6. Demographic Analysis

Refer to the sections on Description of Fishing Activities (Section 7), and Economic Characteristics of the Fishery (Section 8) in Amendment 8 to the Atlantic Surfclam and Ocean Quahog FMP (MAFMC 1990). See also the 2000 Surfclam and Ocean Quahog quota recommendations paper (MAFMC 1999b).

9.7. Cost Analysis

This regulatory action does not impose any additional reporting or compliance costs on the industry. Refer to the "Impacts of Proposed Alternatives" section above.

9.8. Competitive Effects Analysis

Competition in the surfclam and ocean quahog fisheries will only be affected by the annual quotas if surplus quota were to persist for an extended period of time. If independent fishermen with lesser access to a market were unable to sell their quota shares for either species for an extended period, it could result in their exit from the industry and an increase in concentration. A surplus existed in the federal surfclam fishery in 1997 and 1998, but corrected in 1999. A surplus currently exists in the federal ocean quahog fishery, and is being monitored closely. Corrective action will be recommended in the future if the situation warrants. To date, no reduction in competition is apparent from actions related to the annual quotas.

9.9. Identification of Overlapping Regulations

The proposed action does not create regulations that conflict with any state regulations or other federal laws.

9.10. Conclusions

The preceding analysis of impacts relative to the Regulatory Flexibility Act indicates that the proposed regulatory actions will not have a significant negative impact on small entities engaged in the surfclam or ocean quahog fisheries.

10. PAPER WORK REDUCTION ACT OF 1995

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

The Council is not proposing measures under this regulatory action that will involve increased paper work and consideration under this Act.

11. IMPACTS OF THE PLAN RELATIVE TO FEDERALISM

The Specification recommendations do not contain policies with federalism implications sufficient to warrant preparation of a federalism assessment under Executive Order 12612.

12. REFERENCES

Fox, Dick. Personal communication. NY Dept. of Environmental Conservation, East Setauket, NY.

McGowan, J. 1993. Personal communication. ME DMR, Augusta, ME.

Mid-Atlantic Fishery Management Council (MAFMC). 1990. Amendment 8 to the Atlantic Surfclam and Ocean Quahog Fishery Management Plan.

_____. 1999a. Amendment 12 to the Atlantic Surfclam and Ocean Quahog Fishery Management Plan.

_____. 1999b. Overview of the Surfclam and Ocean Quahog Fisheries and Quota Recommendations for 2000.

_____. 2000. Overview of the Surfclam and Ocean Quahog Fisheries and Quota Recommendations for 2001

String, Connie. Personal communication. NJ Enforcement Office. Port Republic, NJ.

USDC 1998a. 26th Northeast Regional Stock Assessment Workshop. NEFSC Ref. Doc 98-04

USDC 1998b. 27th Northeast Regional Stock Assessment Workshop. Draft.

USDC 2000. Guidelines for Economic Analysis of Fishery Management Actions. Draft Revised 8-16-2000. NMFS Office of Sustainable Fisheries, Silver Spring, MD.